



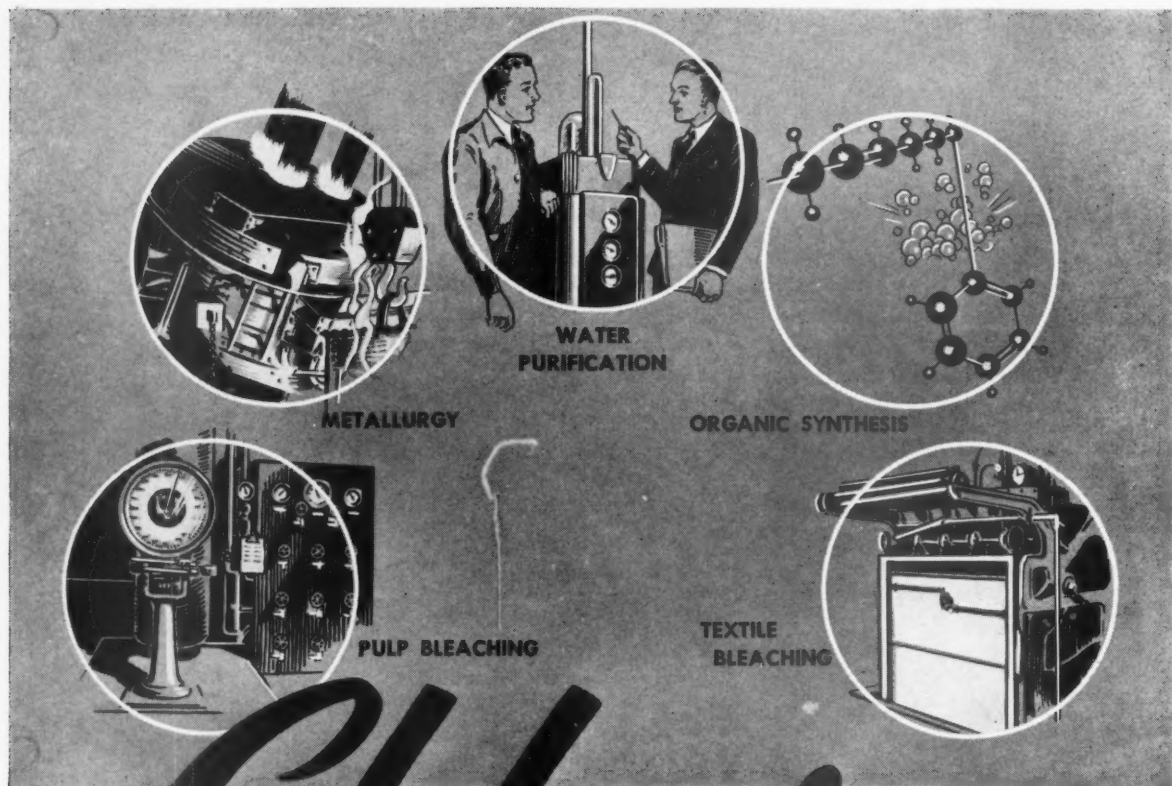
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Vol. 17 • No. 1

Pulp & Paper

PACIFIC INDUSTRY

JANUARY • 1943



Chlorine

CHEMICAL SERVANT EXTRAORDINARY

In a century and a half of industrial development chlorine has become one of man's most useful chemical servants. Its first commercial application was made in 1799 by Charles Tennant, who manufactured bleaching powder for textile manufacturers.

In 1800 Tennant produced a few tons of bleaching powder. Today chemical plants in America are turning out well over a million tons of chlorine—much of which has been drafted for wartime military and industrial effort.

Penn Salt pioneered in the produc-

tion of liquid chlorine, being first to manufacture it in commercial quantities. The first tank car of this essential chemical was shipped from our Wyandotte, Michigan, works in 1909. Our operations have continued to expand since that time until today our Wyandotte and Tacoma works are among the largest chlorine producers in the United States.

As a result of our production of chlorine for today's wartime uses, we are able to look forward to the promise of even greater peacetime possibilities.

PENNSYLVANIA SALT
MANUFACTURING CO. OF WASHINGTON
Chemicals
TACOMA, WASHINGTON



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Pacific Coast Industry*

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WPB Allows Paper Pulp Shipments During January

To supply paper mills whose inventories are low, shipments must be maintained if converting mills are to continue present level of production and quality. Opinion divided as to whether Coast log situation will improve in Spring. WPB orders reduced paper consumption.

AFTER two months of dependence upon inventories and supplies from Canada, Middle Western and Eastern converting mills are receiving wood pulp shipments from Pacific Coast pulp mills. The lifting of the ban on eastward shipments of paper pulps, applied during November and December by the Pulp and Paper Division of the War Production Board, is for the month of January only. However, there is hope that shipments may be continued during February. Beyond February the WPB's allocations will be determined by then current conditions, needs of converters for high grade paper pulps and the availability of logs for making the pulps.

During November and December, paper pulp produced on the Pacific Coast on a curtailed basis, was allocated by the WPB for Lend-Lease shipments. During that period the converters drew upon inventories and were allocated Canadian pulp which came principally from Eastern and Middle Western Canada, shorter rail hauls than from the Pacific Coast. Estimates on the inventories at the buying mills indicated that on the average they would be about exhausted by January 15th. Hence the WPB's action prevented shutdowns or drastic reductions in quality of the various papers and boards being made by the converters.

It is reported that the supply of high quality Eastern American and Canadian pulp proved inadequate, at the present rate of operations, to replace corresponding grades normally supplied by Pacific Coast mills, and that much news grade unbleached sulphite was shipped over from Canada to make up the deficits. However, lower quality pulp can be used only to a small degree as a diluent without impairing the qualities necessary in papers and boards for war uses. TECHNOLOGY

While shipments of paper pulp from the Pacific Coast to consumers in other regions are being permitted this month, it should be kept in mind that the supply available for shipment has been greatly reduced

not only through curtailment of production but, too, because of the conversion of considerable former paper pulp producing capacity to nitrating pulp production. Exact date cannot, of course, be published at this time.

It is mentioned to emphasize that the present levels of production and quality of mills dependent upon purchased pulp possibly cannot be maintained even if shipments of Pacific Coast paper pulps are continued eastward, for the reason that there will not be enough pulp available from this area. It appears that the alternatives are further curtailment of paper and board production or reduced qualities through the use of more lower grade short haul pulps and of more waste paper.

The solution will probably come out of a combination of both. Already the WPB has ordered elimination of many items of paper and board which are considered non-essential.

There is danger in the handling of this pulp situation of penalizing the mills that purchase pulp to the benefit of the self-contained plants. The WPB's Pulp and Paper Division is apparently cognizant of this danger and is proceeding with care, weighing fully the effects of each move.

There is another factor involved in the curtailment of pulp and paper production which has not yet been fully felt; namely, the rapidly increasing usage of paper and board for essential packaging and for other war needs. This is gaining headway but no one can predict what volume the substituting of paper and board for scarcer materials will eventually amount to. In view of these potentialities for increased war needs the WPB will have to proceed slowly in curtailing pulp, paper and paper-board production to the point where many more mills are forced to shut down. Once a mill is down and its employees dispersed into other fields, it is virtually impossible to start again under today's conditions. The British have suffered from being to quick to concentrate an in-

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dustry, it is reported, and are now more cautious.

On the Pacific Coast the all around impression of pulp and paper manufacturers is that the Pulp and Paper Division of the WPB is doing a pretty fair job. More than that they feel that the attitude of the division is cooperative within the limits of its authority. It is believed that the Pulp and Paper Division desires to correct inequalities as quickly as it can do so.

The Pacific Coast Log Situation

● The log shortage and the readjustments it has caused are irritating all around. The most essential pulp and paper and other timber products logically get the first call on the logs. This means that those who may have some logs but whose final product is not used directly in the war must give a share to those whose products are directly used in the war but who do not have enough logs. This is not a satisfactory relationship for either group but both are cooperating to the fullest extent in the realization that it is necessary to the winning of the war.

The inequalities this relationship has created could be minimized by a sensible compensation plan. However, compensation is not entirely within the jurisdiction of the Pulp and Paper and the Lumber Divisions, of the WPB. Basically, it is the problem of the Committee on Concentration of Production of the WPB, and it has been slow to evolve plans for compensating those

companies seriously affected by the WPB's actions. This committee wants the industries involved to offer plans. (See pages 20-22, November, 1942, issue.)

In the case of logs any plan of compensation would most likely involve prices and that would bring in the OPA. Mention of the OPA brings to mind immediately a vast amount of paper work, intricate formulae and the suspicious attitude of some of its employees that any suggestion to alter prices springs from a desire for big profits and inflation. Hence it is natural that industrialists, who are already working overtime suffer in silence as long as possible.

Consensus of opinion says that the log shortage in the Pacific Northwest will grow worse until April when weather conditions will permit resumption of high altitude logging. Agreement ends there. One group takes the view that increased production will merely stop the decline and will not permit inventories to be built up. They point out that a great many of the men who have found other employment when weather forced down mountain logging camps will not return. They point, too, to the recent wage increase made retroactive to September 1st, as a deterrent to continued operations on the part of the small gyppo loggers, many of whom are unable to operate this winter because of weather conditions and whose capital is extremely limited. Then, too, there are insufficient tires allocated to certain logging localities to permit continued logging by all truck loggers who desire to work in the area. This, however, may be worked out through ration boards. Costs versus price ceilings are another deterrent to the small logger, who may find that he can make more money working in a shipyard as an employee than as an employer.

Those who feel the log situation will improve in April base their optimism mainly upon estimates that the Army, Navy and other war agencies will not need as much lumber in 1943 as in 1942. Most of the construction of camps, bases and industrial plants will have been completed they argue, and the demand for lumber is bound to decline. The West Coast Lumbermen's Association said on January 12th:

"Although 1941 was a 53-week year, in terms of work days, and 1942 a 52-week year, the West Coast lumber industry produced practically as much lumber last year as in 1941. In average weekly production, notwithstanding manpower

shortage, the industry bettered the 1941 weekly average by 1.3 per cent. This is a record unmatched by any other lumber producing region.

"The end of 1942 saw war plant construction — cantonments, warehouses, etc. — go over the peak. Looking ahead, the prospect is that requirements of all lumber construction, under limitations on civilian building, will decline from now on to the end of 1943, particularly after the second quarter of the year. There is no prospect, however, of decline in requirements for special war items such as airplane lumber, decking, and structural timbers. Demand for these items may increase, and supply will be a special obligation of the West Coast industry. Further increase of requirements for box and crating lumber is in view. It is evident that for many months ahead, all the war lumber items that West Coast mills can produce will be required.

"Under various controls on West Coast lumber, as established by the War Production Board, the war agencies are given first call on the industry's product. The volume released for requirements that are not direct military needs—for railroad, mine, highway and related types of construction—is running close to one-half of the industry's production. This proportion is more likely to increase than to diminish, for two reasons. The war agencies do not require all of the industry's production of yard items of building lumber. There is growing recognition by the agencies of the necessity of providing for essential civilian uses, such as by railroads, mines, highway construction, defense housing, and farm building that is vital to food production."

The British Columbia logging situation and the Canadian Government's recent move to provide an incentive for increased output during 1943, are reported elsewhere in this issue. Whether any British Columbia hemlock logs will be permitted to cross the border is a matter for conjecture. Some believe the embargo, instituted September 2nd, will be partially lifted. Others point to the log shortage in British Columbia as precluding any possibility of export permits being granted to help out Puget Sound pulp and lumber mills.

WPB Changes Method of Paper Control

● The War Production Board on January 8th issued a sweeping amendment to the General Conservation Order M-241, changing its



FRED G. STEVENOT, recently elected President of the Puget Sound Pulp & Timber Co., has opened offices for the company in the New Bank of America Building, 300 Montgomery St., San Francisco.

method of controlling paper production.

"In a statement presenting the order as amended, the Pulp and Paper Division of WPB pointed out that the order as originally issued was "designed to prevent a runaway market pending the development of a more scientific program geared to requirements. It 'froze' a number of mills and the production of certain grades of paper at low levels. Specific hardships have been relieved through appeals, without relation, however, to any general objective.

"Meanwhile shortage of labor, trucks and tires in the woods have increased, heralding a decline in the production (domestic) of wood pulp for paper, from the current rate of 10,500,000 tons per annum to a rate by the middle of 1943 estimated to be about 8,500,000 tons. This, together with increasing estimates of requirements, renders imperative a new program.

"Under the previous form of the order, production of paper and paperboard was running at the rate of approximately 3,800,000 tons per calendar quarter, as the total for all types. Under the order, as now amended, production of the tonnage permitted for the first calendar quarter of 1943 is estimated to be approximately 4,100,000, an increase of 8 per cent.

"This increase is required in order to permit expanded production of those grades containing waste paper and other waste or non-fibrous material. It is only a temporary measure to allow increased production in these grades pending balancing reductions in other grades.

"Important specific provisions under the order as now amended are as follows:

"(1) No production in any mill which has not been in production since August 1, 1942, without specific authorization by the Director General for Operations.

"(2) Each mill is required each quarter to calculate its quarterly production quota by applying various percentages (between 80 and 100) to its production of each of the major classes of paper during the six months ending March 31, 1942.

"In general each mill's production is limited each quarter to its quota thus calculated, but a mill may produce within that quota any grade or grades desired, regardless of what it produced during the base period, provided the aggregate does not exceed the quota. In addition any mill may, over and above its quota, produce any quantity of any of several named grades especially needed for war and essential civilian supply.

"The formula for calculating quotas, as prescribed in the order, requires the elimination of these special grades from the base period figure.

"The percentages to be applied to production in each class, after thus eliminating the special grades, are set out on List A attached to the order as follows:

"Newsprint 90%; Groundwood Papers 80%; Book Papers 80%; Writings 90%; Wrapping Paper 85%; Tissue Paper 100%; Absorbent Papers 80%; Container Board 100%; Folding Box Board, etc. 80%; Set-Up Box Boards, etc. 80%; Cardboard 80%; Special Industrial Boards 90%.

"The unrestricted grades are set out on List B. These are: Sanitary Napkin and Wadding Stock; Absorbent for Vulcanized Fibre; Absorbent for Resin Impregnating and Plastics; Building Papers;

Building Boards; Container Board from waste; Cigarette Paper; Condenser Paper; Carbonizing Paper; Stencil and Lens Paper; Photographic Paper; and, Currency Paper.

"It is expected that the classification and percentages on List A, and the special grades on List B, will be changed from time to time as circumstances require.

"Each manufacturer is further directed to reserve each month two per cent of his quota for the calendar quarter within which the month falls for disposition by the Director General for Operations, in order to meet emergency orders, the prompt fulfillment of which is necessary to war or essential civilian supply. However, if he does not receive directions as to the disposition of this reserve on or before the fifteenth of the month, he may use it for his own business. The reserve, being two per cent of the quarterly quota, will usually amount to about six per cent of the month's production.

"The amended order also contains fairly elaborate inventory restrictions. Inventories of newsprint are limited to 75 days. Inventories of other grades are limited to 60 days, with a special provision allowing paper merchants 90 days. Mill inventories are similarly restricted. These provisions are so worded, however, as to permit small inventories—i.e., two carloads—regardless of the number of days' supply they represent for the particular holder. Entirely exempt from the inventory restrictions are photographic and sensitized paper, cigarette paper and paper that is printed or converted beyond waxing and coating.

"The order contains the usual provisions with reference to records, violations and appeals."

Paperboard Consumption Curtailed

● "Food, wearing apparel, gifts and other familiar products sold at retail will be packaged in new types of paperboard boxes, while some merchandise will not be packaged at all under provisions of Limitation Order L-239, issued January 8th by the Director General for Operations.

"To provide more containers for many products formerly packed in tin, the amount of paperboard that may be used in specified folding and set-up boxes is curtailed by simplifying design and eliminating frills.

"Additional paperboard will be saved by the following:

"1. Elimination of dummy boxes.
"2. Elimination of boxes for packaging alcoholic beverages.

"3. A 35 per cent reduction in the production of boxes used by retailers for packaging merchandise for retail distribution.

"4. Restricting the quality of paperboard that may be used in the manufacture of boxes to package Christmas, birthday, and wedding gifts, or for any other special occasion or seasonal purpose.

"The purpose of these restrictions is to conserve virgin wood pulp which the folding and set-up box industry consumes. Adequate supplies of pulp are difficult to obtain because of a shortage of manpower and transportation facilities.

"In addition, the order also is designed to confine the use of folding and set-up boxes to essential packaging. Sufficient supplies of boxes are expected to be available for such purposes. Con-

sumers may have to carry some products home unpackaged.

"This order will save approximately 225,000 tons of paperboard, or 10 per cent of the estimated amount of such board used during 1942, to make additional containers for the packaging of a number of foods, tobacco, and other products which formerly were packed in tin. Furthermore, a large supply of wood pulp will be saved by the restrictions in the use of paperboard. Manufacturers have shifted to paperboard boxes for packaging many items, because of the shortage of tin. Use of tin for the packaging of many products is prohibited.

"Some of the boxes which are eliminated by this order are considered to be non-essential during war time. The order does not affect the manufacture of corrugated or fibre shipping containers.

"The order affects the use of boxes for the following products: holiday, and other seasonal goods; butter, lard, oleomargarine; ice cream; crackers and baked goods; alcoholic beverages; retail goods (including gift boxes); envelopes; papeterie; waxed paper (cutterboxes); sporting goods; toilet tissue; display goods.

"Under the order, definite sizes of some of these boxes are specified, and in some instances, the amount and maximum quantity of paperboard which may be used are also specified. This is expected to result in many changes of methods of packaging to save paperboard, and to meet the specifications permitted by the order.

"The amount of paperboard that may be used during any quarter of 1943 in the manufacture of boxes used by merchants package merchandise for retail distribution is restricted to 65 per cent of the tonnage used in such boxes in the corresponding quarter of 1941.

"Holiday or gift boxes or sleeves may not be any more elaborate or contain any more material than boxes which are used for common packaging. A sleeve is a



LEO C. KELLEY, Sulphite Superintendent at the Woodfibre mill of the British Columbia Pulp & Paper Co., has been transferred to the Vancouver head office as General Sulphite Superintendent for both Woodfibre and Port Alice operations.

container in which a box is inserted. This is expected to simplify boxes for packaging gifts and items for other special occasions.

"No metal may be used in any handles, bails for pulls, or for any nailing clips or fasteners for mailing containers, thereby saving about 1,000 tons of metal a year.

"Box manufacturers may not make boxes from the following grades of paperboard if such grade contains virgin wood pulp: news board, single news vat-lined chip, colored box board chip back, bending chip board, colored suit box chip back, mist color suit box chip back, solid jute, cracker shell board, or solid news.

"The order applies to all manufacturers of folding and set-up boxes, including companies which produce such boxes for their own use.

"The following restrictions apply to food, beverage and tobacco boxes:

"Butter, Lard, Oleomargarine, and Similar Boxes—Manufacture of boxes having a content capacity of less than one pound are prohibited.

"Ice Cream Boxes—Manufacture of any boxes for direct fill factory packed ice cream is limited to boxes having a content capacity of one pint, one quart, two and one-half gallons, or larger.

"Cracker and Baked Goods Boxes—Manufacture of boxes for packaging crackers or baked goods must comply with the specifications specified by this order. These specifications limit the boxes, flaps, and openings to specified dimensions. They also specify the kind of folding or set-up boxboard which may be used in the boxes.

"Beverage and Tobacco Boxes—Manufacture of any boxes for packaging alcoholic beverage boxes is prohibited. Such beverages include whisky, gin, rum, brandy, liquors, cordials, wines and beer. However, boxes may be made to package these beverages for medicinal preparations.

"No restrictions are placed on tobacco boxes.

"The following restrictions apply to retail boxes. Restrictions on manufacture of retail boxes: Beginning January 1, 1943, the tonnage of paperboard used in the manufacture of retail boxes is restricted to 65 per cent of the amount put into process during the corresponding quarter of 1941.

"Manufacturers may not produce any boxes for sale at retail as empty boxes.

"Restrictions on retail set-up boxes—Manufacturers are required to manufacture retail set-up boxes as specified by this order. The specifications limit the size of the box, lid depth, and specify the weight of paperboard which may be used.

"Material for retail boxes—Manufacturers may not use any grade or quality of paperboard higher than solid news No. 2 finish, or gage list No. 3. Gage lists are described in the following publication by the United States Department of Commerce: 'Simplified Practice of Recommendation of 44-36 Entitled Box Board Thickness.' They may not use any bottom paper if the box is strip wrapped. They may not use any lining other than news vat lining on the side of the board forming inside of the blank.

"Restrictions on retail folding boxes—No metal may be used in any retail boxes for the packaging of flowers, clothing or other garments, or laundry. Likewise, no paperboard which contains virgin

wood pulp may be used for such boxes. This means that these boxes will be made chiefly of plain chip board, news board and mist color grades.

"Retail boxes, as defined in the order, are chiefly those used by retailers for packaging merchandise for retail distribution. However, this does not include boxes for packaging foods, drugs, medical supplies or custom jewelry.

"The following restrictions apply to boxes for packaging paper products:

"Envelope Boxes—No paperboard in excess of the following quality may be used in the manufacture of any set-up envelope box: Bending chip board, News vat lined chip No. 2 finish, Sheet lined board, Count in excess of the maximum specified by this order.

Gage List No. 2—No paperboard in excess of the following quality or quantity may be used in folding boxes for papereries: Patent coated news back without sheet lining, Greater weight per box than required for an equivalent cubical content set-up box.

"No metal may be used in papeterie boxes.

"The following features are prohibited in the manufacture of folding and set-up papeterie boxes: Slides, Drawers, Shoulders, Base or cover caps, False bottoms, ends or sides; Padded tops, or other false work.

"However, boxes for packaging envelopes containing more than 23 envelopes with corresponding note paper may be made with false work up to one-fourth the volume of the box.

"Waxed Paper cutter boxes: Dimensions of cutter boxes for packaging rolls of waxed paper must conform with specifications of L-239.

"Quality of paper board may not be higher than bleached manila lined news basis 70 sheets per 50-pound bundle.

Jacoby Promoted At Camas

Becomes Assistant Technical Supervisor, succeeding Francis W. Flynn, now in the Navy.

● Walter Jacoby of the technical department of the Crown Willamette Paper Company, Division of Crown Zellerbach Corp., Camas, was recently appointed assistant technical supervisor. G. H. Gallaway is technical supervisor of the Camas mill.

Mr. Jacoby succeeds Francis W. Flynn, who has been commissioned as an officer in the Navy and began training at the Navy's ordnance school at Ithaca, N. Y., on January 1st.

The new assistant technical supervisor also assumes duties as professor in charge of the first year students in the Crown Willamette Paper School at Camas.

Mr. Jacoby is a graduate of Montana State College. His brother Bernard was one of a large group from the technical department who have left for officers' training in the Army.

"Roll Toilet Tissue—Manufacture of boxes for packaging roll toilet tissue is prohibited. The following regulations apply to sporting goods boxes:

"Golf, Tennis, Baseball, Football, Volley Ball, and Basket Ball Boxes—Manufacture of boxes for packaging less than 12 golf, tennis, or baseballs is prohibited. Use of box metal or sheet lining is prohibited. Manufacture of any box for packaging inflated footballs, volleyball or basket balls is prohibited.

"Use of paperboard must not exceed specifications permitted by this order.

Use of Paper Prohibited in Many Articles

● The amount of paper that may be used by converters in the manufacture of converted paper products was curtailed on January 8th by the Director General for Operations through the issuance of Conservation Order M-241-a.

"(A converter is defined as any person engaged in the business of manufacturing from pulp, paper, or paperboard any of the articles listed in the order.)

"The order sets up two lists, A and B, each enumerating a number of paper products. Paper (including pulp and paperboard) may be used for List A products in amounts ranging from 50 per cent to 110 per cent of the amount used in 1942. This list includes a variety of articles from envelopes to paper towels.

"On and after February 15, however, no converter is allowed to use any paper at all in the manufacture of any of the articles on List B. Typical List B products are albums, coasters and mats, doilies, poker chips, tray covers and mats, and Venetian blinds.

"In regard to List A products, the converter has two choices: He may take



WALTER JACOBY, Assistant Technical Supervisor at Camas.

for any quarter the percentage figure given for the product in which he is interested and apply it to the corresponding quarter of 1942. That is, if the figures given were 90 per cent, he would be allowed to consume up to 90 per cent of the amount he used for the corresponding quarter of 1942. Secondly the converter may instead simply take the entire calendar year of 1942 as a base and use for any given quarter one-fourth of what he is allowed on List A.

List A

Articles or class of articles	Percentages
Chair seat covers	75
Dishes, plates and spoons	90
Envelopes	90
Expansion pockets, unprinted	90
Facial tissue	90
File folders, unprinted	90
Fly paper	90
Household rolls (waxed)	90
Index tabs, unprinted	90
Napkins	90
Paper stationery and papeteries	90
Photo mounts	75
Ribbon, all types, including package ties, and ribbon blocks and cores	90
Salt and pepper shakers	90
Tablets, notebooks and pads	100
Toilet seat covers	100
Toilet tissue	110
Towels	90
Waxed papers, other than bread wrappers	90
The following decorative items as a group:	
Friction glazed paper	50
Flint glazed paper	
Metallic coated paper	
Mica coated paper	
Plated papers	
Mate finish papers	

List B

Articles and classes of articles in the manufacture of which pulp, paper or paperboard may not be used after February 15, 1942.

Albums and album covers, including scrapbooks, for photos, snapshots, post cards, clippings, stamps, matchbook covers, etc.

Aprons.

Ash trays.

Bakers decorative specialties, such as:

- (a) Pie collars and rings.
- (b) Cake circles.
- (c) Cake laces.
- (d) Casserole collars.

Bird cage specialties, such as:

- (a) Bird cage bottoms.
- (b) Bird cage covers and hoods.
- (c) Bird cage food holders.

Boquet holders for displays, corsages, etc.

Card table covers.

Coaster and mats, such as beer mats, and coasters of the type commonly used for households, hotels, taverns, restaurants, etc.

Coin cards.

Combs.

Costumes.

Doilies.

Dusters and dusting paper.

Finger bowl liners.

Hanger protectors.

Laundry specialties, such as:

- (a) Shirt bands.
- (b) Collar circles.
- (c) Collar supports.
- (d) Shirt protectors and envelopes.
- (e) Shirt boards.
- (f) Shirt displays.

Novelties, holiday, party, advertising, and decoration, such as:

- (a) Garlands.
- (b) Serpentine.
- (c) Horns.
- (d) Hats.
- (e) Table decorations and place cards.
- (f) Streamers, including those for window display and decoration.
- (g) Flower pot covers.
- (h) Costumes.
- (i) Decalcomania transfers (for non-commercial use).
- (j) Artificial flowers and flower specialties (for non-commercial use).
- (k) Confetti.
- (l) Festoons.
- (m) Fireworks.
- (n) Skewers.

Place and table mats.

Poker chips.

Punch boards.

Retail packages shelf and drawer lining.

Slippers.

Tablecloths.

Tray covers and mats.

Venetian blinds.

Window drapes.

Puget Sound Men In Service Receive Reader's Digest

● The seventy-three employees of the Puget Sound Pulp & Timber Company at Bellingham who are now in the armed forces were pleasantly surprised at Christmas to receive a greeting card saying they would receive a year's subscription to the "Readers' Digest" with the compliments of the company.

E. J. Hayes to Handle WPB Pulp and Paper Work in Northwest

● On December 5th E. J. "Opie" Hayes arrived in Seattle to assume his new duties as regional representative of the Pulp and Paper Division of the War Production Board. Prior to taking up his headquarters in the White-Henry-Stuart Building Mr. Hayes spent three weeks in Washington, D. C., becoming acquainted with his new work.

He is well known in the Pacific Northwest pulp and paper industry. Mr. Hayes moved to Tacoma in 1928 from the Middle West during the construction of the Union Bag and Paper Power Corporation's kraft pulp mill there. From that year until November, 1942, he was office manager of the plant, now the St. Regis Paper Company, Kraft Pulp Division, and for the past five years he has served as log buyer for the 250 tons per day bleached kraft pulp mill. The plant ceased operations November 1st by order of the WPB because of the log and manpower shortages in the Puget Sound area. Mr. Hayes succeeds Ray Schadt, who, on leave from the Crown Zellerbach Corporation,

Longview Fibre Employees Join Company in Charity Donations

● In an outstanding example of management-employee cooperation in a great charity cause, the Longview Fibre Company and its employees jointly contributed \$8,500 to the Longview, Wash., Community Chest this winter. They went far beyond the quota assigned to the plant, which was \$6,000.

The union played an important role in making this unusual record, handling the collections from approximately 1,200 employees.

This record-breaking joint contribution of company and workers goes to many worthy charities through the Community Fund, including the United Service Organizations, the YMCA and YWCA, Boy Scouts, Camp Fire Girls and Chinese, French, British, Greek and other relief agencies.

Powell River and Ocean Falls Employees Get Raise

● Blanket wage increases of four cents an hour for employees of the Powell River Company at Powell River and of Pacific Mills, Ltd., at Ocean Falls have been approved in an order of the British Columbia regional war labor board.

● The increase raises the basic wage in the two pulp and paper plants to 60 cents an hour and retroactive to December 1. Application for the increase was made jointly by the managements and the employees.



E. J. HAYES, Regional Representative, Pulp and Paper Division, WPB, Seattle.

Flood Hits Willamette River Mills

But fast work minimizes damage. Motors saved at West Linn.

Hawley log losses small.

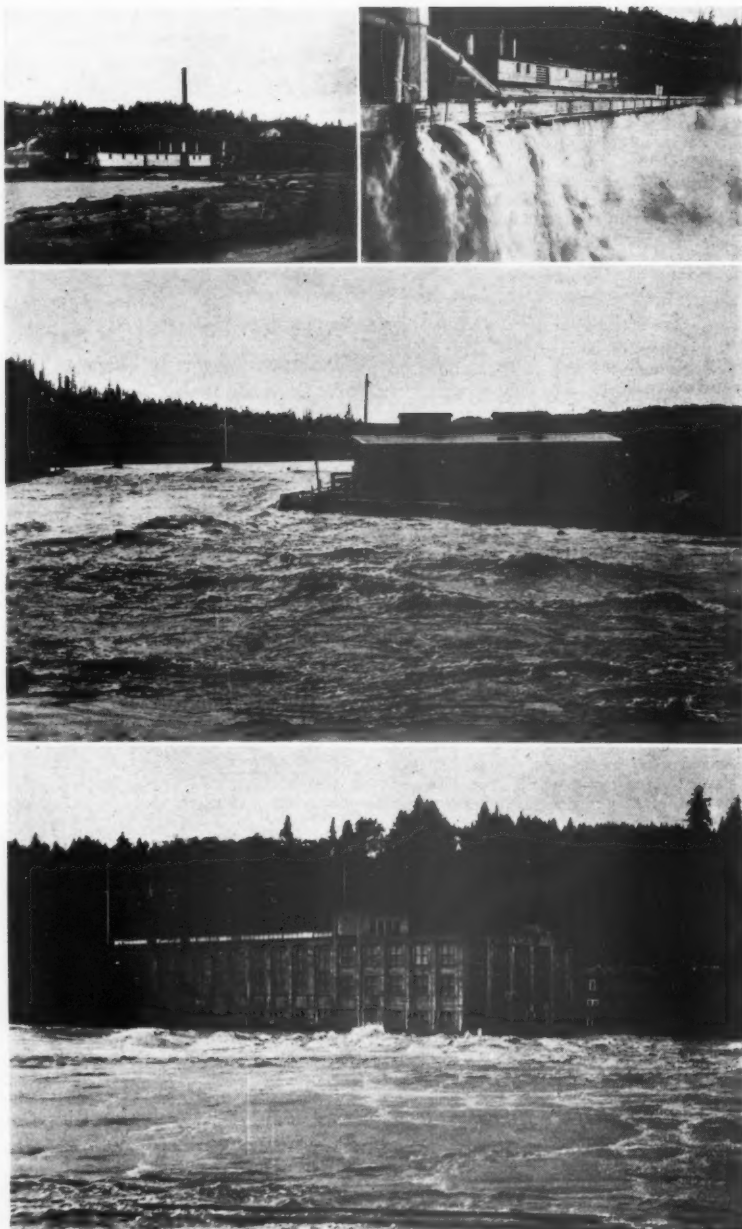
● Old river hands on the Willamette are becoming accustomed to floods. There's not much one can do about a river on a rampage but get out of its way. But alert, experienced men do know a few tricks. It was this type of man—from supervisors and mechanics down the line—at the Hawley Pulp and Paper Company at Oregon City, the Crown Willamette Paper Company at West Linn and the Oregon Pulp and Paper Company at Salem who kept losses at a minimum in those plants when the surging, raging Willamette reached its highest flood level in 20 years early this month.

A rock filled crib dam at the end of the Hawley log pond, owned by the Portland General Electric Company, was ripped out for a distance of 150 feet. But only a dozen or so logs went through as most of the Hawley logs were held upstream. An old pulp barge, used only for wood storage, and a rented tugboat were wrecked. Knee deep water shut down 20 grinders in Mill A, standing out in the river across the broken dam, but the company was able to continue partial operation by use of its electric grinders.

At the West Linn Crown Willamette mill, division of Crown Zellerbach Corp., water rose to five feet in the machine room basements and fast work of foremen and crews rescued more than 100 motors. In the same way, many motors were rescued at Hawley, too, where a few got wet. The break in the dam at the Hawley mill across the river pushed the crest of the flood over toward the West Linn plant and gave the employees little time to carry out rescue operations. Wearing high boots, the men waded in and rushed motors to higher levels. As a result of the speedy action, only four or five motors in West Linn's Paper Mill C were wet. Most West Linn logs were upriver and losses were only about 400,000 feet.

Officials of Oregon Pulp and Paper Company said salvage operations were futile for most of 1,100 tons of finished paper stored in the Larmar warehouse. They saved 500 tons in the main mill plant. They lost a considerable amount of logs.

But fast recoveries were made by



WILLAMETTE RIVER FLOOD interrupts production at the Hawley Pulp & Paper Co., and the Crown Willamette Paper Co., Division of Crown Zellerbach Corp., at West Linn, Oregon. In the top left picture is the Hawley wood barge and log pond before the flood and the rock crib dam forming the pond is shown at the right.

Immediately below is shown the log pond after the flood had broken the dam. Hawley's groundwood Mill A was flooded and isolated from the shore. The bottom photograph shows part of the Crown Willamette West Linn mill with the flood waters rising.

the mills, with everyone from supervisors down pitching in to clean up. Paper machines were back in operation in a few days.

Although not as high as the disastrous flood of 1923, C. E. Bruner, resident manager at West Linn, said in its nature, this flood was more destructive, with larger swells and more surging. In 1923 the water rose to nine feet in the basements. It may have risen to only five feet this time because the river channel had been dredged deeper.

Between the Hawley and C-W mills is the horseshoe falls, familiar to anyone who has visited those plants. When a PACIFIC PULP AND PAPER INDUSTRY representative arrived on the scene on Sunday, January 3, just as the flood had reached its crest, the falls were practically non-existent, the great flow of water leveling out the river. Between the mills there is a gorge-like squeeze play put on the river and even in normal times, observers estimate the river arches six feet higher in the middle than at either side.

The wood dam at Hawley's Mill A was built originally in 1887. There was a small break in this dam in 1907. In the higher flood of 1923, only about fifty feet of the dam was washed out, only about one-third the size of the break this month. The dam proper is the power company's property and the walk linking Groundwood Mill A with the main part of the Hawley plant and stock, water and steam lines and a flume carrying wood belonged to the Hawley company. These were all carried away and the usually tranquil log pond, lying between Mill A and the Oregon City shoreline, became a raging torrent.

There were two breaks in the wood dam. The first came at about 7 a.m. January 2. Across the river at West Linn, it raised the water 23 inches in "nothing flat," the harried rescue workers there said. Another portion went out about 5 p.m. the same day, raising water an additional 16 inches at West Linn.

At Hawley the operations had been shut down in Mill A two days before the break and Carl E. Braun, vice president and mill manager, or-

dered the watchmen to discontinue making rounds after midday January 1. Because of the well understood risks involved, no one was allowed to cross to the mill. A watchman had checked the pumps on the old pulp barge just a few minutes before the break.

Then the entire Hawley mill was shut down, as was West Linn. But fast, effective work at Oregon City made it possible to start up on newsprint again Tuesday afternoon, January 5, and other machines returned to activity in the next few days.

Because of inability to bring logs into the basement, the Hawley sawmill was started up on a slow basis on January 9.

It is presumed that the power company will throw a catwalk across to isolated Mill A and close the dam again by putting in timbers from both ends. Mr. Braun, J. A. Wilson, assistant manager and others went by boat to Mill A on January 9, to make a survey of the situation there.

The flood reached an elevation of 68.2 feet in the upper river. It rose right to the top of head gates at West Linn, splashing over them. There was a terrific clean-up job to be done, the water having left six inches to a foot of silt in the mills.

At West Linn, the groundwood mill only was shut down the day before the dam break, and the entire plant the next day. But by January 7, the No. 5 and No. 6 paper machines and half of the grinding room were back in operation. The rest of the plant was being cleaned up rapidly and equipment reinstalled for resumption of work.

All in all, the flood found worthy foes in the mills of Oregon City, West Linn and Salem.

Clayton Smith Missing After Destroyer Sinking

● Clayton Smith, son of Fred Smith, veteran employee of the Puget Sound Pulp & Timber Company, Bellingham, was reported as missing following the sinking of a U. S. Destroyer recently. His was the first name enrolled on the list of the Bellingham chapter of the Veterans of Foreign Wars for those serving in World War II, his father being a past commander of the post.

Puget Sound Employees Receive Turkeys

● Over four hundred employees of the Puget Sound Pulp & Timber Company at Bellingham received fifteen-pound turkeys from the company for Christmas.



RAGING TORRENT of the Willamette River damages both the Crown Willamette and Hawley mills. In No. 1 and No. 2 is shown the break in the rock crib dam on the Hawley side. Hawley's groundwood Mill A appears at the left and part of Crown Willamette's West Linn plant in the background.

No. 3, the crest of the flood is caught by the camera as it passes the two paper mills at Oregon City. No. 4, the break in the dam from the down river side, and No. 5, the turbine drive for Hawley's No. 2 paper machine entirely under water. The photographs on this and the other page were taken by Harold Lent, an assistant to Carl E. Braun, Vice President and Mill Manager, Hawley Pulp & Paper Co., and by John M. Fulton, Manager, Pacific Coast Supply Co., Portland.

Cut of Independent B. C. Loggers Down 26% in First Ten Months of 1942

Due to low price and embargo on exports / / / Output of loggers associated with sawmills declined but 2%.

● When Canada's timber controller, A. H. Williamson of Vancouver, returns to his home town during the coming month he will learn at first hand many of the problems associated with the export of pulp logs to Puget Sound—a contentious issue ever since he took charge at Ottawa.

While a rigid embargo now prevails on all log exports from British Columbia to the United States, considerable pressure has been exerted for a relaxation of these restrictions, according to British Columbia sources. The pressure has come from mill operators, from United States senators, War Production Board officials and British Columbia loggers.

While the loggers affiliated with the large sawmill interests in British Columbia are not seriously concerned in the matter inasmuch as there is a guaranteed market for their output and lumber prices have been advanced several times, the independent open-market loggers are in a different category. The embargo has deprived them of one of their most profitable outlets and there has been nothing in the way of higher log prices to compensate them for their loss.

That the open-market logger is not an insignificant element in the situation is indicated by the fact that last year they were responsible for about 60 per cent of the total cut in British Columbia. That they suffered from various restrictions far more than the loggers affiliated with sawmills is shown by statistics revealing that decrease in their production during the first ten months of 1942 amounted to 26 per cent while loggers associated with sawmills in British Columbia showed a decline of only 2 per cent.

The loggers claim that while the processors of timber—the sawmills, plywood mills, shingle mills, etc.—have had many incentives to increase production, they themselves have had nothing but discouragement.

"Release from the log embargo now wouldn't help much as there is an actual shortage of logs in British Columbia today," one big operator told Pacific Pulp & Paper Industry, "but the shortage is partly due to the fact that the loggers knew they couldn't make ends meet at pre-

vailing Canadian prices and they voluntarily held back production to some extent. If, however, they were advised that the embargo might be lifted next spring they could lay their plans now for a big production program and all elements would benefit."

While Mr. Williamson recently pointed out that Canadian exports of lumber to the United States were at an all-time high last year he omitted reference to the fact that lumber exports to that market had been negligible until spiraling demand in the United States made it attractive for Canadian mills to ship there in spite of the customs duty. This was partially offset by the premium on the United States dollar.

There has been a corresponding increase in log prices on Puget Sound in the past two years that would have normally brought about tremendous increase in log exports from British Columbia had an embargo not been declared. There might have been an argument about the most effective use of British Columbia's raw material in the war effort prior to 1941, but it is difficult now to see where there is much difference in the effect on this war ef-

fort whether the logs are shipped to the United States.

The history of hemlock logs under Canadian timber control has been similar to that of fir. Hemlock has been sold at a ridiculously low price, from the loggers' viewpoint, for years and was not placed under control until November, 1941. At that time the logger was beginning to see some hope of handling hemlock logs without loss when the controller set the price at \$13.50, which was a dollar less than the prevailing market.

As a result of this arbitrary action very little hemlock was produced that winter and in the spring the pulp and sawmills dependent on open market hemlock logs were in a bad way, so the control price was raised to \$15 in April. This price would have helped production if it had been allowed some months earlier, but the increase came too late to assist the 1942 production. Then in September, 1942, the usual action was taken—hemlock logs exports to Puget Sound were forbidden. Log stocks of this species are now much lower than a year ago and two important pulp mills are faced with the prospects of short rations this winter.

Canadian Logging Stimulated By Extra Depletion Allowance

● Pulpwood producers in British Columbia will be indirectly benefited by special tax concessions granted by the Canadian government respecting sawlogs so as to increase production of the latter during the present year.

Loggers engaged primarily in cutting pulpwood will be granted the special allowances, but only in respect to sawlogs cut.

The concessions recognize that the lumber industry is depleting its available supply of standing timber at a fast rate during a period of abnormal costs as a contribution towards the war effort. The special allowance is to be regarded neither as a bonus nor a subsidy. It represents an allowance deduction from taxable income.

This makes it clear that it will be of no benefit to logging operators who experience a loss. On the other hand it should be the means of enabling numerous operators to carry on who otherwise could not see their way to continuing the practice of conducting costly logging operations, depleting their stands of timber, without having enough to show for it to maintain their organizations and secure new timber stands with a view to future operations.

The prospect was such as dissuade marginal operators from carrying on. The special allowance may be expected to give an immediate stimulus to preparations for the 1943 operations in the woods of the coastal area.

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The concessions have been designed to provide the greatest advantage to those who put forward the most effort to increase production. There will be an allowance of one dollar per thousand feet on all sawlogs cut in 1943, but there will be an additional allowance of one dollar per thousand feet for all sawlogs cut in 1943 that are in excess of 60 per cent of sawlogs cut in 1941, or in special circumstances, to sawlogs cut in 1943 that are in excess of 60 per cent of sawlogs cut in 1942.

Canadian News Mills To Ask \$10 Raise

● Newsprint mills in Canada are seeking authority from Washington and Ottawa for an increase in the price of newsprint amounting to at least \$10 to compensate for higher costs of transport, pulpwood and labor.

The general expectation in the trade, however, is that if higher prices are authorized they will not represent an advance of more than \$5 a ton, in view of opposition from publishers. The decision rests not with the operators, but with the Wartime Prices and Trade Board in Canada and the Office of Price Administration in Washington.

Spokesmen for the newsprint industry point out, however, that there has been no increase in the price of their product since 1938, and that costs have increased sharply in some directions in spite of the efforts of price control authorities to combat inflationary tendencies.

Prices are made on the basis where transport costs are borne by manufacturers. For instance, the New York price is \$50 a ton, delivered in New York, and that is the base price for the entire industry, at Powell River and Ocean Falls on the west coast as well as at Ontario and Quebec mills.

Inasmuch as cheaper water transportation cannot be used to any appreciable extent, the manufacturers have had to pay the higher rail rates to distant points. Wage rates have risen in the newsprint industry since the last price change—in British Columbia they were boosted again only last month—and woodpulp costs are also considerably higher.

Consumption figures indicate that demand is being well maintained, but current consumption statistics have lost much of their significance in view of enforced curtailment of newsprint operations to conserve manpower and electric power for direct war purposes. Reports indicate that curtailment of production in Canada this year may be 20 per cent or more, which would wipe out profit margins for most producers unless some adjustment were made in the price list.

Early last year Canadian newsprint mills planned an increase in the price of their product, basis New York delivered, to \$53 a ton. At that time there was no indication of arbitrary restrictions on production, with corresponding adverse effect on profit margins. The United States OPA forbade price increases to be charged by American mills and Canadian mills felt it advisable to forget about attempting to raise the schedule for the time being.

But now it is contended that, in view of all the conditions affecting the industry, a boost of at least \$10 a ton is justified. Capital structures of newsprint com-

panies generally were deflated drastically some years ago, but even with their present capital setups Canadian mills are shipping out the country's forest resources in the form of newsprint at sacrifice prices.

Newsprint consumers on the other hand point out that they are faced with severe reduction in advertising revenue and that they could not continue to operate in the face of substantially increased paper prices.

First Aid Detachments Organized At Stockton

● Volunteer first aid detachments are being organized at the Stockton, Calif., plant of Fibreboard Products, Inc., under the direction of Al Dodge, first aid instructor. Advanced 10-hour courses were held during the early part of January, and it was stated that a staff of at least 50 trained persons will be required adequately to cover the plant in case of disaster. The enthusiastic response to a call for volunteers was highly praised by executives of the company.

Mispley Named Assistant Technical Director of CZ

● Robert G. Mispley returned from a tour of eastern and southern states in late December to actively take over his new duties at Camas as assistant technical director of the Crown Zellerbach Corporation.

Mr. Mispley actually was appointed to his new post several weeks ago and the trip was the first to be made by him in his new capacity. He visited many fruit auction markets and other enterprises in the east and south in promotion of Crown Zellerbach's new diphenyl citrus wrapping tissue (described in the November issue of PACIFIC PULP AND PAPER INDUSTRY).

The appointment of Mr. Mispley as administrative assistant to William R. Barber, technical director, was made by the executive office of the corporation in San Francisco as part of a plan to expand the research and development work of the company.

"Bob" Mispley was born in Sacramento, Calif., and lived there until his graduation from Oregon State College in 1931, where he received a degree in chemical engineering. He then joined the Crown Zellerbach organization and has been with it ever since.

He first served in the Camas, Wash., mill technical department. In 1938 he was transferred to the corporation's central technical department, also located in Camas. In his new post his headquarters, of course, will continue to be there,

Anacortes Merged Into Coos Bay

● On December 31st, attorneys for the Coos Bay Pulp Corporation, filed with the Secretary of State of Washington an "agreement merging with and into itself the Anacortes Pulp Company of Anacortes, Washington, and increasing capital to \$1,000,000."

Both companies are subsidiaries of the Scott Paper Company of Chester, Pa. The Anacortes unbleached sulphite pulp mill was shut down November 1st by order of the War Production Board on the basis of log and manpower shortage in the Puget Sound area. The Coos Bay plant at Empire Oregon, continues to operate at capacity of 70 tons daily of unbleached sulphite pulp.

William S. Campbell, vice president of the Scott Paper Company, was president of both subsidiaries. C. Wylie Smith is vice president and manager of the Coos Bay Pulp Corporation. John McKirdy, Jr., vice president and manager of the Anacortes plant, has been transferred to other work with the Scott Paper Company.

where the corporation has a modern, fully equipped laboratory.

Mr. Mispley and his wife have lived all their married life in Camas, where they are a well known and popular couple. They have two children.

During his college career, Mispley was elected on the basis of achievement in scholarship to Phi Lambda Upsilon, national chemistry honorary society, and to Tau Beta Pi and Sigma Tau, both national engineering honoraries.



ROBERT G. MISPLEY,
Assistant Technical Director,
Crown Zellerbach Corp.

Training and Conservation Discussed At Longview TAPPI Dinner

THE Pacific Section of TAPPI held its January dinner meeting on the 5th at the Hotel Monticello in Longview, Washington, with 85 men present. Chairman Edward P. Wood made arrangements and presided.

Two talks and two moving pictures made up the interesting program. Robert H. Williams, assistant district representative, Training-Within-Industry Division War Manpower Commission, Seattle, spoke on "Where Job Instructor Training Fits into the Induction Procedure." Mr. Williams is on leave of absence from the Crown Zellerbach Corporation and Rayonier Incorporated as an assistant to Otto R. Hartwig, general safety supervisor for the two corporations.

The second speaker was O. T. Defieux, superintendent of the steam plant, Crown Willamette Paper Company, Division of Crown Zellerbach Corporation, Camas, Washington, whose subject was "Conservation of Critical Materials in the Pulp and Paper Industry."

Mr. Defieux's Talk

● Here are the highlights of Mr. Defieux's discussion. The outcome of this war will depend, he said, to a very large extent upon the war production effort of American industry. The scarcity of certain materials vital to the war effort make it necessary that their use in non-vital industries and for domestic purposes be curtailed or in some cases eliminated entirely.

The restrictions in the use of these materials placed upon us as members of industry and also as individuals should not be considered as impositions but rather as a partnership trust in the nation's war effort.

Recently, said Mr. Defieux, the Office of War Information announced 1942 production approximately as follows: 49,000 airplanes, 32,000 tanks and self-propelled artillery, 17,000 anti-aircraft and 20 mm. guns, 8,200,000 tons of merchant shipping, thousands of anti-aircraft machine guns; and other thousands of scout cars and ½ and 1 track carriers. In addition we carried on an extensive naval construction program.

This was above the most optimistic estimate of a year ago, Mr. Defieux pointed out. As a matter of

fact there was little optimism about being able to meet such a goal last Spring. After we were drawn into the war the WPB on several occasions warned the pulp, paper and paperboard mills that the industry's usage of critical materials must be reduced as an alternative to a production curtailment program similar to that applied to the automobile, refrigerator and other industries.

In May the WPB called a meeting of representatives of the pulp and paper industry to formulate a plan for reducing the usage and conserving critical materials. Thirty-one men attended from all parts of the country and Mr. Defieux was one of the Pacific Coast representatives. The industry committee leading the discussion included Stuart E. Kay, manager of manufacturing, International Paper Co.; Rex W. Hovey, vice president in charge of manufacturing, Oxford Paper Co.; and H. H. Hanson, president of W. C. Hamilton & Sons. A plan was offered for curtailing the consumption of strategic materials but was rejected by the committee. A second plan was approved by the committee and submitted to the WPB but was not released by the industry. However, Mr. Defieux emphasized, it must have helped for the ideas it contained have since appeared in suggestion form. The group was told that the industry had been consuming for replacements and repairs only, approximately 5,536 tons of copper per year; 403 tons of tin; 558 tons of rubber; 45 tons of chromium and 237 tons of nickel.

Much has been done since last Spring, said Mr. Defieux to promote the exchange of ideas on how to conserve vital materials. The American Paper & Pulp Association in cooperation with the Technical Association has issued nineteen bulletins on conservation practices. The American Pulp & Paper Mill Superintendents Association and the Technical Section of the Canadian Pulp and Paper Association have also issued much material.

In addition associated industries making rubber products, electrical equipment, machine tools and supplies, have issued suggestions for making equipment last longer and render trouble-free service.

Nor, said Mr. Defieux, must we forget the members of the Pacific

Coast industry and PACIFIC PULP & PAPER INDUSTRY for its remarkable contribution of ideas from the Pacific Coast mills published in the May Review Number.

Suggests Coordination of Ideas

● What about 1943? We know that a tremendous increase in war material is necessary and will be forthcoming, also that certain materials will become more critical. The materials situation is becoming more serious. Mill stocks of parts and maintenance materials are lower than ever before. Regardless of whether the product of our mill is 100 per cent vital to the war effort or only partially so, the need for good conservation practice exists. The need for the development of more substitutes exists. What is the best way to accomplish greater conservation and to develop new substitutes?

In answer Mr. Defieux asked if we are making the best use of available information. What information is available and how can it be obtained. Would it be worthwhile, he asked, to establish a collection and distribution center for conservation practices and substitutes under control of the Pacific Section of TAPPI?

Mr. Defieux stated that this idea was being presented to the Pacific Section of TAPPI's executive committee for consideration.

He called upon H. Norman Miller of Westinghouse Electric & Mfg. Company, Portland, for a statement as to availability of electrical repair parts. Mr. Miller said that to obtain repair parts today the mills must certify that they do not have spare parts and have tried at least three used machinery dealers before Westinghouse can accept an order.

As to wire, Mr. Miller said that only varnished cambric covered cable was available. Rubber and other coverings are available only on the highest priority.

William C. Marshall of the Pacific Coast Supply Company representatives for Heller and Merz, dyestuff manufacturers, stated that adequate supplies of dyestuffs are now available although certain dyestuffs are still critical.

Ed Hein of the Longview Mill,

Pulp Division Weyerhaeuser Timber Company, engineering department, outlined some of the practices employed conserving materials. Scrap lead has been remolded and used in place of stainless steel. Bands on wood pipe have been lengthened by welding on new ends and threading. As long as rubber base paints are available these are helpful in fighting corrosion he said. Plastic tubing is being used in many places as a substitute for copper.

Two moving pictures were shown, "Hemlock Harvest," a kodachrome of the Crown Zellerbach Corporation's logging operations at Neah Bay on the northwestern tip of the Olympic Peninsula. The company's standard practices providing for re-growth, the leaving of adequate seed trees and the protection of the new growth against fire were pictured. The second picture, "Trees For Tomorrow," was a story of the lumber industry's modern methods of cutting with thought for future cropping of the forests. It showed the growing application of the sustained yield principle, the treating of the forests as crop producers in contrast with the obsolete viewpoint that forests were like mines, irreplaceable when once used.

Chairman Wood announced that no meeting was scheduled for February to replace the Tacoma dinner which had been cancelled when the two mills there had been shut down by WPB order. The next meeting will be held in Portland, March 2nd and the place will be announced later along with the program.

The following men attended the Pacific Section of TAPPI's dinner

meeting held on January 5, 1943, at the Hotel Monticello, Longview, Washington.

• O. C. Abbott, Bristol Co., Seattle; Niles M. Anderson, Tacoma; Charles Bannan, Western Gear Works, Seattle; E. R. Barrett, A. O. Smith Corp., Seattle; R. B. Beal, The Flox Co., Minneapolis; Geo. H. Beisse, Pulp Division Weyerhaeuser Timber Co., Longview; P. W. Brackett, Longview Fibre Co., Longview; Norman J. Briggs, Pulp Division Weyerhaeuser Timber Co., Longview; A. M. Cadigan, Cellulose Products Laboratory, Tacoma.

R. F. Calligan, Pulp Division Weyerhaeuser Timber Co., Longview; J. G. Carson, Longview Fibre Co., Longview; Claud Christiansen, Cellulose Products Laboratory, Tacoma; W. W. Clarke, Longview Fibre Co., Longview; J. V. B. Cox, Hercules Powder Co., Portland; John N. Crosby, Longview Fibre Co., Longview; R. E. Dana, Longview Fibre Co., Longview; Harold A. Deery, Pulp Division Weyerhaeuser Timber Co., Longview.

O. T. Defieux, Crown Willamette Paper Co., Division of Crown Zellerbach Corp., Camas; David M. Dibrell, Longview Fibre Co., Longview; A. E. Erickson, Pulp Division Weyerhaeuser Timber Co., Longview; Ed Escher, Longview Fibre Co., Longview; Carl Falstrom, Longview Fibre Co., Longview; Bert W. Farnes, R. E. Chase & Co., Portland; Donald G. Felthous, Pulp Division Weyerhaeuser Timber Co., Longview; John M. Fulton, Pacific Coast Supply Co., Portland; G. H. Gallaway, Crown Willamette Paper Co., Division of Crown Zellerbach Corp., Camas; James Gould, Longview Fibre Co., Longview; C. H. Graham, Bumstead-Woolford, Portland; John F. Hart, Longview Fibre Co., Longview; W. H. Haverman, Pulp Division Weyerhaeuser Timber Co., Longview; S. E. Hazelquist, Pulp Division Weyerhaeuser Timber Co., Longview; J. S. Heigel, Pulp Division Weyerhaeuser Timber Co., Longview; E. J. Hinde, Pulp Division Weyerhaeuser Timber Co., Longview; H. F. Hoehne, Longview Fibre Co., Longview; O. L. Hudrlik, The Flox Co., Portland; W. C. Jacoby, Crown Willamette Paper Co.,

Division of Crown Zellerbach Corp., Camas.

W. N. Kelly, Pulp Division Weyerhaeuser Timber Co., Longview; John W. Klein, Longview Fibre Co., Longview; R. J. LeRoux, Pulp Division Weyerhaeuser Timber Co., Everett; S. J. Mannus, Longview Fibre Co., Longview; Wm. C. Marshall, Pacific Coast Supply Co., Portland; Robert W. Martig, Brown Instrument Co., Portland; V. S. Mauerman, Pulp Division Weyerhaeuser Timber Co., Longview; C. J. McAllister, Simonds Worden White Co., Portland.

F. D. McGillicuddy, Jr., Rayonier, Incorporated, Hoquiam; C. L. McPhail, Pulp Division Weyerhaeuser Timber Co., Longview; Paul F. Miescke, Pulp Division Weyerhaeuser Timber Co., Longview; H. Norman Miller, Westinghouse Electric & Mfg. Co., Portland; Roy R. Miller, Crown Willamette Paper Co., Division of Crown Zellerbach Corp., Camas; K. M. Milligan, Northwest Lead Co., Seattle; T. E. Moffitt, Hooker Electrochemical Co., Tacoma; D. C. Morris, James Brinkley Co., Seattle; A. G. Natwick, Crown Willamette Paper Co., Division of Crown Zellerbach Corp., Camas; N. H. Norton, Longview Fibre Co., Longview.

E. H. Nunn, Crown Willamette Paper Co., Division of Crown Zellerbach Corp., West Linn; James E. Peake, Longview Fibre Co., Longview; H. T. Peterson, Pulp Division Weyerhaeuser Timber Co., Longview; Willis C. Peter, Hooker Electrochemical Co., Tacoma; A. S. Quinn, Stebbins Engineering Co., Seattle; E. D. Rich, Cellulose Products Laboratory, Tacoma; E. J. Roake, Crown Willamette Paper Co., Division of Crown Zellerbach Corp., West Linn; A. W. Russell, Longview Fibre Co., Longview; Walter A. Salmonson, Simonds Worden White Co., Seattle; Otto H. Sangder, Rayonier Incorporated, Hoquiam.

Jack V. Savage, Crown Willamette Paper Co., Division of Crown Zellerbach Corp., Camas; J. W. Schuh, Longview Fibre Co., Longview; Harlan Scott, Pacific Pulp & Paper Industry, Seattle; W. J. Shelton, Longview Fibre Co., Longview; Anton Siebers Longview Fibre Co., Longview; Larry K. Smith, Pacific Pulp



The Head Table at the Longview TAPPI Dinner, January 5th. Left to right, KYLE MILLIGAN, Northwest Lead Co. (back to camera); C. J. McALLISTER, Simonds Worden White Co., Portland; ROBERT M. TRUE, General Dyestuff Corp., Portland, Secretary-Treasurer, Pacific Section of TAPPI; NILES M. ANDERSON, Third Vice-President, American Pulp & Paper Mill Superintendents Assn., and past chairman of the Pacific Coast Division.

O. T. DEFIEUX, Superintendent of Steam Plant, Crown Willamette Paper Company, Division of Crown Zellerbach Corp., Camas, one of the speakers; R. S. WERTHEIMER, Vice President and Resident Manager, Longview Fibre Co., and a member of the Executive Committee of National TAPPI; and EDWARD P. WOOD, Technical Director, Longview Mill, Pulp Division Weyerhaeuser Timber Co., and Chairman of the Pacific Section of TAPPI.

ROBERT H. WILLIAMS, Assistant District Representative, Training-Within-Industry Division, War Manpower Commission, Seattle, on leave from Crown Zellerbach Corp. and Rayonier Incorporated, who spoke at the meeting; W. NORMAN KELLY, Manager, Longview Mill, Pulp Division Weyerhaeuser Timber Co.; A. G. NATWICK, Assistant Resident Manager, Crown Willamette Paper Co. Division of Crown Zellerbach Corp., Camas; RUSSELL J. LeROUX, Manager, Everett Mill, Pulp Division Weyerhaeuser Timber Co., Everett; and, D. C. MORRIS (back to camera), James Brinkley Company, Seattle.

& Paper Industry, Seattle; Roy R. Sullivan, Weyerhaeuser Timber Co., Longview; Virgil M. Sutherland, Longview Fibre Co., Longview; Paul J. Thiess, Longview Fibre Co., Longview; Lloyd Thorpe, Weyerhaeuser Timber Co., Tacoma.

R. M. True, General Dyestuff Corporation, Portland; W. G. Van Beckum, Pulp Division Weyerhaeuser Timber Co., Longview; H. Vay Wagner, Pulp Division Weyerhaeuser Timber Co., Longview; Harold C. Wall, Longview Fibre Co., Longview; J. W. Wenger, Central Technical Dept., Crown Zellerbach Corp., Port Angeles; R. S. Wertheimer, Longview Fibre Co., Longview; J. A. Wilcox, Longview Fibre Co., Longview; Robert H. Williams, War Manpower Commission, Seattle; D. D. Wilma, Longview Fibre Co., Longview; Albert Wilson, Pacific Pulp & Paper Industry, Portland; Edward P. Wood, Pulp Division Weyerhaeuser Timber Co., Longview.

Powell River Allocated 5.65% of Canadian Production

● Powell River Company has been granted 5.65 per cent of Canada's total newsprint production for the period from April 1 to September 30, 1943, as part of the plan for restricting deliveries of all Canadian mills to 90 per cent of their average between October 1, 1941, and March 31, 1942.

The other Canadian west coast newsprint producer, Pacific Mills, has been assigned 1.85 per cent of the total.

The new Canadian order supersedes one issued by Newsprint Administrator R. L. Weldon October 28, restricting production to 100 per cent of the average

monthly quantity produced for sale within Canada from April 1 to September 30, 1942.

"The order prohibits delivery or acceptance of newsprint in any quantity which would increase the buyer's stock beyond 75 days' supply on the basis of current methods and rate of operation or sale," the Wartime Prices and Trade Board states. "However, one carload or less may be accepted if it does not bring the buyers' inventory above two carloads.

"If a particular item of newsprint is under 30 days' supply, it may be delivered even though the gross inventory is up to or above the prescribed maximum."

With the production-reducing order, the Prices Board has established a compensation plan for the industry. This scheme provides for setting up a special fund. Manufacturers who turn out more newsprint than their quota will pay into the fund, while those who produce less will be compensated out of the fund.

Each newsprint manufacturer is assigned an established percentage of the total production under this plan. The percentages were worked out after consultation with members of the industry's advisory committee, including Harold Foley and R. Bell-Irving of Powell River Company and John A. Young of Pacific Mills.

Following are the percentages of all Canadian mills:

Abitibi Power & Paper Co. Ltd., 13.01; Anglo-Canadian Pulp & Paper Mills Ltd., 4.70; Bathurst Power & Paper Co. Ltd., 0.39; Beaver Wood Fibre Co. Ltd., .060; J. R. Booth Ltd., 0.30; Brompton Pulp & Paper Co. Ltd., 0.93; Canadian International Paper Co., 15.89; Consolidated Paper Corp. Ltd., 12.90; Donnacoma Paper Co. Ltd., 1.87; Donohue Bros.

Ltd., 1.87; E. B. Eddy Co. Ltd., 1.00; Great Lakes Paper Co. Ltd., 2.76.

Lake St. John Power & Paper Co. Ltd., 2.30; James MacLaren Co. Ltd., 2.30; Mersey Paper Co. Ltd., 2.68; Ontario-Minnesota Pulp & Paper Co. Ltd., 4.31; Ontario Paper Co. Ltd., 4.28; Pacific Mills Ltd., 1.85; Powell River Co. Ltd., 5.65; Price Bros. & Co. Ltd., 8.52; Provincial Paper Ltd., 5.12; Quebec North Shore Paper Co., 3.32; St. Lawrence Paper Mills Co. Ltd., 4.1; St. Raymond Paper Ltd., 0.30; Spruce Falls Power & Paper Co. Ltd., 4.84.

Grossenbacher Recovers from Illness

● Armen L. Grossenbacher, personnel director at the Columbia River Paper Mills in Vancouver, Wash., successfully recovered from a major abdominal operation in early December and was able to return to his post in mid-January. Colleagues at the plant were pleased to see him back again. He has been connected with the plant for 15 years.

Mrs. Grossenbacher, who works in the mill office, said her "best Christmas present" was the return of her husband to his home from the hospital on Christmas Eve.

Some months ago PACIFIC PULP AND PAPER INDUSTRY became a schoolroom textbook temporarily as a result of the initiative of young Armen Grossenbacher, Jr., 14-year-old son of the Columbia River Paper Mills executive. Armen brought graphs and articles from this magazine to his school in Vancouver and used them in giving his class a lecture on paper making. His mother said the boy was praised by his teacher for his resourcefulness.

An Ode to Grandpa From Washougal

● On more than one occasion in the past the pulp and paper industry has been forced to recognize the remarkable claims to piscatorial prowess put forward so modestly by one A. G. Natwick. This is the same Natwick, who, as a sort of sideline when he is not busy pursuing the anadromous poisson, finds spare time to perform the duties of assistant resident manager of the Crown Willamette Paper Company, Division of Crown Zellerbach Corp., at Camas, Wash.

But all past tributes to Fisherman Natwick fade into insignificance in comparison with this latest one which has been written by his admiring associate, Jack V. Savage, sulphite superintendent at Camas. Apparently, this budding poet pursued the Great Fisherman to his secret haunts up the "Grandpa of the Rivers," which is the Columbia, and its tributaries. Now he has put into verse the true story of the Natwickian knack for nabbing the pisce, which the "Grandpa from Washougal" kept secret for so long. And here it is:

Through the sage-brush spotted wastelands,
Through the wild and rugged mountains,
Rolled the Grandpa of the Rivers
On its way to join the ocean.
Close beside it, near Washougal,
Lived another mighty Grandpa.
Fellow-nimrods spoke in whispers
Of his prowess at Celilo.
Here the mighty silver salmon,

On their trek of reproduction,
Match their serength against the waters
Of the roaring, white-capped rapids.
Here, since ages long forgotten,
Siwash savages have come each season;
Here to fill their meager larder
Against the ravages of winter.
Then the pale-faced hordes descended,
Men of every rank and station.
All returned with glowing stories,
Told with arms outstretched to measure.
Foremost of these story-tellers
Was the Grandpa from Washougal:
Never was his tepee empty
Of the fruits of his endeavors.
Then one day in green-eyed envy
He was trailed by fellow nimrods
Who had vowed to learn the secret
Of his prowess at Celilo.
Stealthily the nimrods trailed him,
Trailed him to a Siwash tepee.
There they heard him softly murmur:
"Huy huy lum kopas tenas pish"*
The literal meaning of this jargon,
As revealed by old Chief Wahoo,
Was that Grandpa brought some joy-juice
To barter for some salmon.

*This is true Chinook for "Trade firewater for little fish. If the "fisherman" felt more confidence in making the offer, he would substitute "hyas" meaning big, for "tenas" meaning little—Editor.

The author offers his apologies to Longfellow.

Many Show Interest In Harris Wire Patch

● Praise from many quarters has come to Jess A. Harris, paper mill superintendent at the Crown Wilmamette Paper Company, division of Crown Zellerbach Corp., at West Linn, Ore., for his ingenuity and resourcefulness in devising a method of quickly patching a fourdrinier wire.

His method, as explained in the November issue of the **PACIFIC PULP AND PAPER INDUSTRY** involved no sewing and, where it can be successfully applied, is proving a time-saver and also fits right into the current wartime campaign for conservation of materials, especially metals.

As the article explained, Mr. Harris' "Victory" patch can be applied in five to eight minutes. It involves careful preparation of the wire patches, which he makes ahead of time, and are attached by hooking of warp wires into the mesh.

Since the article appeared, Mr. Harris reports that he has successfully applied several of his patches to wires in production of newsprint, of carbonizing sheets and telephone paper. He is ready to concede that on certain kinds of stock, his patch may or may not work. Much depends upon the skill in making and applying the patch. Generally speaking, however, Mr. Harris said if a sewn patch is impossible then his patch won't work either. But in any case, it has to be put on right.

Mr. Harris said one patch he put on a wire started to fill up. But then he blew it out with a steam hose and it remained clean and ran altogether for about a week. It was going good when a regular shutdown allowed for a wire change without loss of working time. During this week it was used on carbonizing sheet and telephone paper.

He made three wire patches which were used successfully in running toweling. One ran for three days, two ran for one day each, and all endured until the Sunday shutdown. Another patch ran for a day on news, Mr. Harris said, which was as long as it was wanted.

A kraft paper mill superintendent who has had much experience in experimenting with patches has not found patches of any kind that work successfully for him. He said he had tried from 60-mesh wire in a

patch to as low as 30 mesh but in no cases would the patch keep clean.

When running sized stock, the wire tends to fill up where the patch is, he said. Besides, they were only able to hold at most for 48 hours.

In kraft production, the vacuum runs from 2 inches to 7½ inches and more pull on the wire causes it to wear faster. Whereas the Harris patch may be kept clean in running pulp and newsprint, the resin in sized stock tends to deposit on the wire, it was found by this superintendent.

A. Fred Crossman, president of the Lindsay Wire Weaving Company of Cleveland, O., congratulated Mr. Harris on his method of patching a fourdrinier wire and said:

"It seems to me a very practical method and the thing that should be most attractive to paper mills is the opportunity for them to conserve metals by keeping their fourdrinier wires running longer. It was very generous of you to publish this so that others could benefit by it."

A letter from H. B. Gerber, representative of Williams-Gray Company of Chicago, said:

"Your method of patching is not only economical but very practical and will no doubt be of assistance to many operators in conserving the vital metals, which we are all endeavoring to get the greatest amount of use from during these trying times. There is little question but what the trade will appreciate your contribution towards obtaining the maximum life from a fourdrinier wire."

Harry G. Specht of the Eastwood-Neally Corporation of Belleville, N. J., said:

"This is a most interesting write-up and you describe it (the patch) in a manner that is clear and definite. Your ability to do a job of this nature indicates you no doubt are very adept with your hands and in the handling of tools."

Another congratulatory message from S. M. Suhr, of Pioneer Rubber Mills, San Francisco, said: "As you know, I am better acquainted with rubber covered rolls than I am with fourdrinier wires, but nevertheless I know enough about such equipment to realize the importance of a quick patch during these times. Apparently you have worked out a fast,

efficient way of doing this. Therefore, congratulations are in order."

Dan E. Charles, who is Pacific Coast representative for Warwick and Knox felts and for O'Neill wires, was so impressed with the idea's usefulness that he told Mr. Harris he was circulating a large number of copies of the November **PACIFIC PULP AND PAPER INDUSTRY** among superintendents of eastern Canadian mills whom he visits.

Ed Tidland of the Pacific Coast Supply Company, representatives for Eastwood wires, is in regular contact with all Pacific Northwest mills. He reports that many superintendents and machine tenders have been experimenting with the Harris patch and that a number have adopted it as a big saver of time and material.

Pulp Mills to Get Waste Wood from New B. C. Operation

● Pulp and paper producers in British Columbia will benefit indirectly from the plans of Aero Timber Products, Ltd., for expediting production of aircraft spruce and hemlock on the Queen Charlotte Islands and other parts of British Columbia's west coast during the present year.

Under the direction of R. J. Filberg, president, and J. H. McDonald, vice-president, Aero Timber Products, a federal government corporation, is making extensive arrangements for mobilizing aircraft stock wherever it can be obtained, and selective logging will be initiated wherever there are good stands of spruce and hemlock.

As a preliminary the company has purchased the entire plant and equipment of Allison Logging Company for \$350,000, and it is arranging for the other two big operators on the Queen Charlottes, J. R. Morgan & Company and Kelley Spruce, Ltd., to open new camps and increase production.

Discussing the deal with Pacific Pulp & Paper Industry, Mr. Allison said that it would not involve his retirement from the logging business as he planned to carry on in other timber claims on the Queen Charlotte Islands and he will also operate a sawmill on the north shore of Burrard Inlet, specializing in aircraft timber, with side cut being available for pulp and paper mills.

Barber Attends WPB Meeting

● William R. Barber, technical director for Crown Zellerbach Corporation, with headquarters at Camas, Wash., left January 7 by train for Washington, D. C., to attend a meeting of the paper industry's national technical development advisory committee.

Acid Making In the Sulphite Pulp Industry

by A. H. LUNDBERG*

CHAPTER I

IN the wood pulping process, invented by B. C. Tilgman and later brought to economical success by C. D. Ekman in Sweden, A. Mitcherlich in Germany and others, a sulphur dioxide compound is used to form water solubles of the non-fibrous constituents of the wood.

It has been proven that sulphurous acid, H_2SO_3 , alone is able to do this work. However, the industry of today is universally using a solution of a metallic bisulphite with a varying amount of free sulphurous acid.

Of the metallic bases calcium and magnesium or a mixture of the two are by far the most commonly used.

Only wood species of a low resin or pitch content are as yet suitable for the sulphite process, a fact that limits its application. It is true that we find sulphite pulp mills in the South using certain types of Pine, but Spruce, Balsam and Hemlock are still the all important species for the sulphite pulp industry.

Hard woods, such as Poplar and Birch, are also cooked, but the tonnage produced is small.

An average Northern White Spruce wood¹ is of the following composition:

Cellulose	60.43%
Lignin	29.00%
Carbohydrates, etc.	10.57%
	100.00%

An average Western Hemlock wood is of the following composition:

Cellulose	59.24%
Lignin	30.37%
Carbohydrates, etc.	10.39%
	100.00%

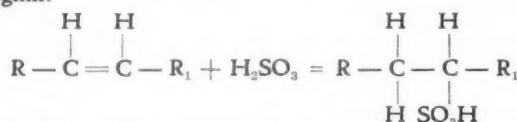
Poplar and Birch are higher in cellulose and correspondingly lower in lignin.

Treatment with bisulphite solutions under the best conditions destroys part of the cellulose, so that the actual yield of cellulose is reduced to about 46%, any additional yield being retention of lignin and other wood constituents.

The carbohydrates are fairly easily converted into water solubles during the cooking operation. Such is, however, not the case with lignin. The lignin is a very complicated substance and only empirical formulas have been proposed which vary substantially from each

other. There is no fully satisfactory theory of the sulphite process. According to Klason² of the total 30 per cent of lignin about two-thirds consists of alpha-lignin ($C_{20}H_{20}O_6$) and one-third beta-lignin ($C_{10}H_{18}O_7$).

The chemical reaction of lignin³ with sulphurous acid is not well understood. The current view is that sulphurous acid adds to an ethelenic group in the lignin:



where R and R₁ represents the remainder of the lignin molecule.

Thus, a strong ligno-sulphonic acid is formed, which in turn reacts with the base to a ligno-sulphonate, i.e., with calcium salt to



Also, according to Klason, complete extraction of the lignin from 100 lbs. of spruce wood should theoretically require 7.91 lbs. of sulphur dioxide and 3.46 lbs. calcium oxide.

Thus, 79 lbs. of sulphur per ton B.D. wood or based on finished pulp, 46% yield,

172 lbs. of sulphur per ton B.D. pulp
and 150 lbs. of calcium oxide
or 270 lbs. of limestone

The bisulphite acid solution used in the sulphite pulping process is produced in two closely linked operations, viz.: Raw Acid and Cooking Acid manufacture.

Though closely linked with one another they are each distinctly separate operations and will be treated as such. As a matter of fact, the more separate the operations are kept, the simpler the acid making and the more uniform the manufactured acid.

RAW ACID MANUFACTURE

I. Raw Materials

- The required raw materials are
 1. Sulphur or pyrites
 2. Calcium or magnesium carbonates, hydrates or other bases
 3. Water

*A. W. Schorger: The Chemistry of Cellulose and Wood.

²T.A.P.P.I.: The Manufacture of Pulp and Paper. Vol. III.

*Western Manager, G. D. Jenssen Company of New York. Mr. Lundberg has been identified with the manufacture of sulphite pulp since 1914. While going to school in Sweden he worked summers in sulphite mills. Graduating in 1915 from the Technical College of Norköping as a chemical engineer, he went to work for Konga A. B. as chemist. From there he went to Oppboga A. B. as research chemist.

Following a 500-day term of service with the Swedish army, Mr. Lundberg became chemist,

assistant engineer and sulphite superintendent for Klippans Finspappersbruk A. B. of Klippans, Sweden. Before leaving for America on January 15, 1921, he served Örebro Pappersbruk, A. B. as assistant superintendent.

His first job on this side of the Atlantic was as chief chemist for The Ha Ha Bay Sulphite Co. Ltd., now the Consolidated Paper Corporation, Ltd., at Port Alfred, P. Q. He then crossed Canada to work for the old Whalen Pulp & Paper Company at Swanson Bay, B. C., for a short time. Returning to eastern Canada he

became chief chemist for The Fraser Companies, Ltd., at Edmunston, N. B.

On January 1, 1924, Mr. Lundberg joined the G. D. Jenssen Company of New York to design and install acid systems. Almost three years later, in September of 1927, he moved to Seattle as Western Manager for the G. D. Jenssen Company. Mr. Lundberg has been closely identified with the great development of the sulphite pulp industry in the Pacific Northwest which began in 1926.

A. Sulphur

● Sulphur, S_8 , is a brittle, pale yellow to yellow element, solid at room temperature. It is insoluble in water but dissolves in carbon bisulphide. There are both rhombic and monoclinic crystalline formations, melting at 112.8°C . (235.0°F .), and 119.2°C . (246.6°F .), respectively to a mobile liquid of an amber color; but, upon further heating, it becomes thick; at about 200°C . (392°F .) it is so thick that it will not flow and has assumed a dark color; at 350°C . (662°F .) the sulphur again becomes fluid and retains its dark color. Sulphur ignites at 248°C . (478°F .), and boils at 444.6°C . (832°F .). Sulphur is obtainable in nature practically chemically pure.

B. Pyrites

● Pyrites, FeS_2 , is an insoluble yellow to brown naturally occurring sulphide of iron which, according to the formula, contains 53.45% sulphur and 46.55% iron. It is, however, seldom found in nature in this high purity.

C. Limestone or Calcite

● Limestone, CaCO_3 , occurs naturally and is in its purest form white and crystalline as, for instance, marble. The appearance of a limestone depends upon the purity of the stone. It is relatively insoluble in water.

D. Magnesite

● Magnesite, MgCO_3 , occurs naturally. It is insoluble in water.

E. Dolomite

● Dolomite is a calcium-magnesium carbonate, normally containing 54.27% CaCO_3 , and 45.73% MgCO_3 , but stone containing one part MgCO_3 and two parts CaCO_3 is also called Dolomite.

F. Lime

● Lime, CaO , is obtained by burning limestone, and its composition therefore depends upon the quality of the limestone.

G. Magnesium Oxide

● Magnesium oxide, MgO , is obtained by burning magnesite. It is insoluble in water.

H. Other Bases

● Sodium Carbonate, Soda Ash or Calcined Soda, Na_2CO_3 , occurs naturally but is also a manufactured compound of sodium and so is sodium bicarbonate, NaHCO_3 .

Ammonia, NH_3 , when dissolved in water reacts to form ammonium hydroxide or ammonium hydrate NH_4OH . The three terms are applied loosely to the solution which is in fact a mixture of ammonium hydroxide and dissolved ammonia gas.

II. Raw Material Specifications

● 1. The sulphur used should be of utmost purity, never less than 98% S. It must be free of arsenic, As, and selenium, Se.

2. The pyrites used should contain not less than 40% S. 50% sulphur content pyrites is obtainable as a flotation by-product. To be satisfactory, pyrites should be nearly free from lead, zinc, antimony, arsenic and selenium. Regarding the last two, it is well known that the presence of even very small quantities may cause serious trouble in the sulphite cooking process.

3. For the limestone it is somewhat difficult to give definite specifications as it has two functions to fulfill. First, to supply the lime requirements, and second, to give absorption surface for the SO_2 gas. The experience¹ is that an increase of the absorption surface has very small influence on the amount of lime going into the solution compared to the pureness of the limerock and the temperature of the water. Chemically seen, the limestone should be relatively pure with a CaCO_3 content of about 98%. The iron content should be low.

The content of magnesium carbonate should also be kept low as the properties of the stone vary according to the amount of magnesium. Magnesium carbonate requires longer reaction time than calcium carbonate.

It is pointed out by Humm that in order to test limerock for suitability the surface must be taken into account, because limestone from different sources, in spite of seemingly having the same surface and chemical content, will act differently in actual operation.

The laboratory method to use nut size pieces of limerock in order to duplicate actual operation is not to be recommended, because there is no proof that the quantitative determination of the SO_2 action on the limerock will be the same. Dr. Humm made several tests on cubes which were of same size and had polished surfaces. They were submerged in HCl and H_2SO_4 solutions of fixed concentrations. Below are his findings:

¹Dr. W. Humm: Untersuchung an Sulfitlaugetürmen zur Kenntnis der Sulfurauge.

TABLE I

No.	Description	Surface		Weight grams	Spec. Gravity
		sq. cm.	sq. inch		
1.	Marble, white	159.6	24.74	364.2	2.662
2.	Marble, black	159.1	24.66	366.9	2.690
3.	Limestone, porous, amorphous	158.5	24.57	324.0	2.387
4.	Limestone, partly porous, small hard crystals	159.1	24.66	341.6	2.502
5.	Limestone, smooth, homogeneous	158.3	24.54	358.3	2.649
6.	Limestone, rough, hard, non-uniform	158.3	24.54	361.4	2.661

Action of Hydrochloric Acid

● All 6 samples were submerged in a normal HCl so-

lution during 60 seconds at 15°C ., 60°F ., thereupon quickly washed, dried and weighed.

TABLE II

No.	Weight Before		Weight After		Dissolved		Grs. per 100 sq. cm.	Lbs. per sq. ft.
	grams	lbs.	grams	lbs.	grams	lbs.		
1.	356.10	.7834	352.2	.7748	3.90	.0086	2.44	.0501
2.	359.45	.7908	355.8	.7828	3.65	.0080	2.30	.0467
3.	315.50	.6941	311.5	.6853	4.00	.0088	2.53	.0516
4.	335.15	.7373	331.8	.7300	3.35	.0073	2.11	.0426
5.	348.65	.7650	343.8	.7564	4.85	.0106	3.06	.0622
6.	352.30	.7751	347.8	.7652	4.50	.0099	2.84	.0581

A 1% SO_2 solution was made by introducing SO_2 gas in distilled water of zero degree Centigrade temperature.

In the 10 liters solution required for the experiment 100 grams SO_2 was consequently absorbed. The concentration of the solution did therefore hardly change

during the experiment. As the time of reaction of the SO_2 solution is considerably longer than for hydrochloric acid depending upon the smaller degree of dissolution, the samples were submerged 5 minutes instead of the 1 minute for HCl. The figures in the table below are, however, recalculated for 1 minute.

TABLE III

No.	Dissolved after 5 minutes grams	Dissolved after 1 minute grams	Grams per 100 sq. cm.
1	0.62	0.124	0.0778
2	0.55	0.110	0.0691
3	0.70	0.140	0.0884
4	0.41	0.082	0.0516
5	0.98	0.196	0.1239
6	0.81	0.162	0.1022

These tests prove that in order to prove the suitability of the limerock the hydrochloric acid solution method may be used as the acid attack on the various limerocks follows the same identical course.

It further proves that dissolution of lime has no definite relation to the specific gravity and the structure of the lime rock.

It must, however, be taken for granted that a dense amorphous stone is better suited than a crystalline of the same specific gravity. On the other hand, an amorphous, porous stone is not to be recommended on account of the pores getting filled up with monosulphite which eventually form gypsum and the reaction speed is retarded. A chemical analysis is consequently no absolute proof of the suitability of a lime stone. However, a chemical analysis and the general appearance of the stone should give a fairly good indication of its suitability.

4. What is said about limestone holds true also for

magnesite and dolomite. As a rule, however, neither magnesite nor dolomite is very suitable in a rock tower system as the reaction between sulphurous acid and magnesium carbonates is so slow that the size of towers get out of proportion.

Dolomite also has the disadvantage that on account of the different reaction rates the calcium will dissolve while the magnesium will settle as a sludge at the bottom of the towers or at times cause clogging of the passages between the rocks.

Following table demonstrates the difference of reaction rates between limestones and dolomites:

III. Production of Sulphur Dioxide Gas A. Sulphur Burning

● When burning sulphur in air one volume of oxygen combines with sulphur to yield one volume of sulphur dioxide.

TABLE IV

Tests of Various Limestones and Dolomites to Determine Suitability In Stone Tower Acid System

	1. Yellow Crystal- line	2. White Crystal- line	3. White Very Small Crystals Marble	4. Grayish- white Flake Crystals	5. Gray Small Crystals	6. Gray Small Crystals	7. White Small Crystals
Chemical Analysis					(((
Unsolubles	(0.06%	-----	1.52%	(((
R_2O_3	(0.10%	0.07%	-----	0.50%	(0.28%	(0.60%	(3.39%
CaCO_3	99.90%	99.87%	100.00%	97.98%	55.69%	55.23%	53.04%
MgCO_3	-----	-----	-----	-----	44.03%	44.17%	43.57%
Spec. Gravity	2.7	2.5	2.6	-----	2.8	2.9	3.0
Loss in weight when submerged for 1 min. in Normal HCl Solution	1.63%	1.98%	1.35%	1.68%	0.24%	0.32%	0.33%
Loss of weight recalculated in grams per 100 sq. cm.	1.7	1.9	1.76	1.84	0.28	0.37	0.45
Loss in weight when submerged for 60 min. in a 4.6% SO_2 Solution	7.5 %	7.82%	6.73%	7.07%	4.82%	3.27%	2.49%
Observations	Strong action Solution clear	Strong action Solution clear	Strong action Solution clear	Normal action Solution clear	Slow action Solution cloudy	Slow action Solution cloudy	Slow action Solution cloudy

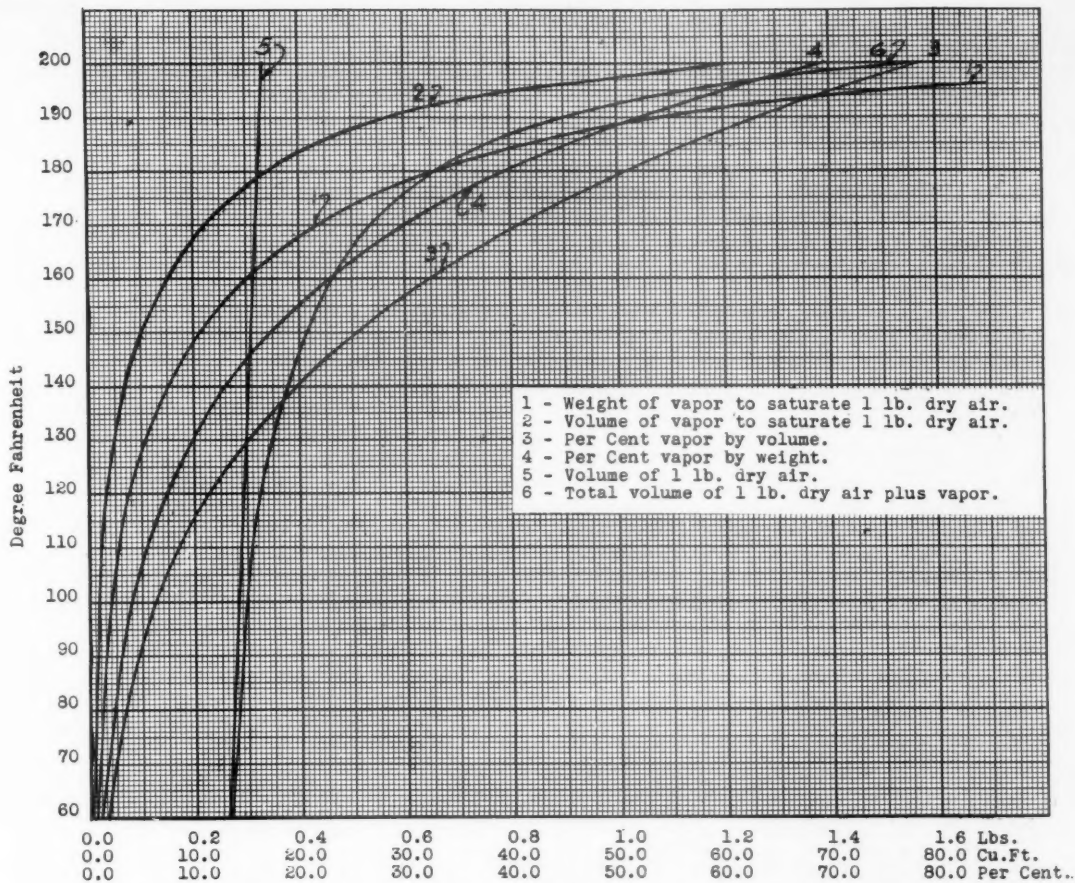


Chart I. Properties of air mixed with saturated water vapor.

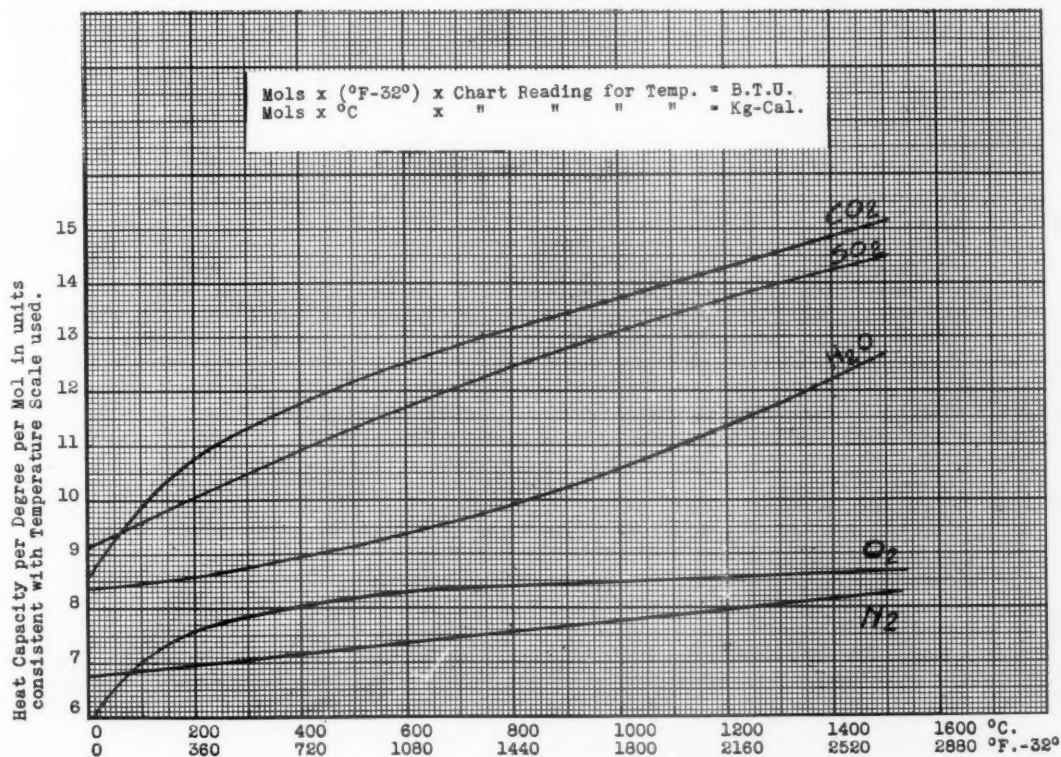


Chart II. Heat Capacities of Gases.



Moisture free air has the following average analysis:

	Per cent	Molecular Weight	Lbs. in 1 molal	Per cent
	Volume	Weight	Vol.	Weight
Oxygen (O ₂)	20.95	32.00	6.70	23.1
Nitrogen (N ₂)	78.08	28.02	21.88	75.6
Carbon Dioxide (CO ₂)	0.03	44.00	0.01	.0
Argon, etc.	0.94	40.00	0.38	1.3
	100.00		28.97	100.0

For simplification air in following calculations is considered to consist of

21% oxygen and 79% nitrogen

	Per cent	Molecular Weight	Lbs. in 1 molal	Per cent
	Volume	Weight	Vol.	Weight
Oxygen (O ₂)	21	32	6.72	23.3
Nitrogen (N ₂)	79	28	22.12	76.7
			28.84	100.0

Thus, when one volume oxygen produces one volume sulphur dioxide, it carries

$$1 \times \frac{79}{21} = 3.76 \text{ volumes nitrogen}$$

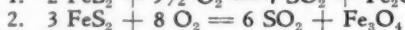
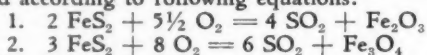
The theoretical possible gas, therefore, will consist of
1.00 volume SO₂
3.76 volumes N₂

4.76 volumes Gas,

and one volume SO₂ is $\frac{1}{4.76} \times 100$ or 21.00% by volume.

B. Pyrites Burning

● When burning pyrites in air sulphur dioxide is formed according to following equations:



a. 5½ volumes of oxygen carry

$$5.5 \times \frac{79}{21} = 20.69 \text{ volumes nitrogen}$$

The theoretical possible gas, therefore, will consist of
4.00 volumes SO₂
20.69 volumes N₂

24.69 volumes Gas,

and 4 volumes SO₂ are $\frac{4.00}{24.69} \times 100$ or 16.20% by volume.

b. 8 volumes of oxygen carry

$$8 \times \frac{79}{21} = 30.09 \text{ volumes nitrogen}$$

The theoretical possible gas, therefore, will consist of
6.00 volumes SO₂
30.09 volumes N₂

36.09 volumes Gas,

and 6 volumes SO₂ are $\frac{6.00}{36.09} \times 100$ or 16.23% by volume.

C. Operation of Burning Equipment

● To produce the theoretical gas strength given, it would be absolutely necessary to have perfect control

PACIFIC PULP & PAPER INDUSTRY

of the sulphur and air supplied to the burners, so that a uniform rate of the correct proportion may be applied at all times, completely and thoroughly mixed.

In practice, such conditions are impossible to obtain and an excess of air is applied to the burner or roaster to insure complete combustion. As a matter of fact, most existing sulphur burning equipment is operated too far below the theoretical mark.

It should be possible to produce a burner gas consisting of at least

from Sulphur Burning: 17% SO₂
4% O₂
79% N₂

from Pyrites Burning: 11% SO₂
7% O₂
82% N₂
100% Gas.

The above combination of the burner gas from pyrites burning is derived from following calculations:

$$1. \quad 2 \text{ FeS}_2 + 5\frac{1}{2} \text{ O}_2 = 4 \text{ SO}_2 + \text{Fe}_2\text{O}_3$$

	Mols O ₂
SO ₂ in gas assumed 11%, thus	11.00
O ₂ to Fe ₂ O ₃ , thus $11 \times \frac{5.5-4}{4}$	4.13
	15.13

$$\frac{15.13 + \text{O}_2}{\text{N}_2} = \frac{21}{79} \text{ and } 11 + \text{O}_2 + \text{N}_2 = 100$$

Hence

O ₂ =	6.93%
N ₂ =	82.07%
SO ₂ =	11.00%

$$2. \quad 3 \text{ FeS}_2 + 8 \text{ O}_2 = 6 \text{ SO}_2 + \text{Fe}_3\text{O}_4$$

	Mols O ₂
SO ₂ in gas assumed 11%, thus	11.00
O ₂ to Fe ₃ O ₄ , thus $11 \times \frac{8-6}{6}$	3.67
	14.67

$$\frac{14.67 + \text{O}_2}{\text{N}_2} = \frac{21}{79} \text{ and } 11 + \text{O}_2 + \text{N}_2 = 100$$

Hence

O ₂ =	7.15%
N ₂ =	81.85%
SO ₂ =	11.00%

Averaging

O ₂ =	7.04%
N ₂ =	81.96%
SO ₂ =	11.00%
	100.00%

The presence of the excess oxygen introduces the danger of not only a serious loss of sulphur but a detriment to acid making, as under certain conditions sulphur dioxide will unite with oxygen to form trioxide:



This reaction, however, is reversible.

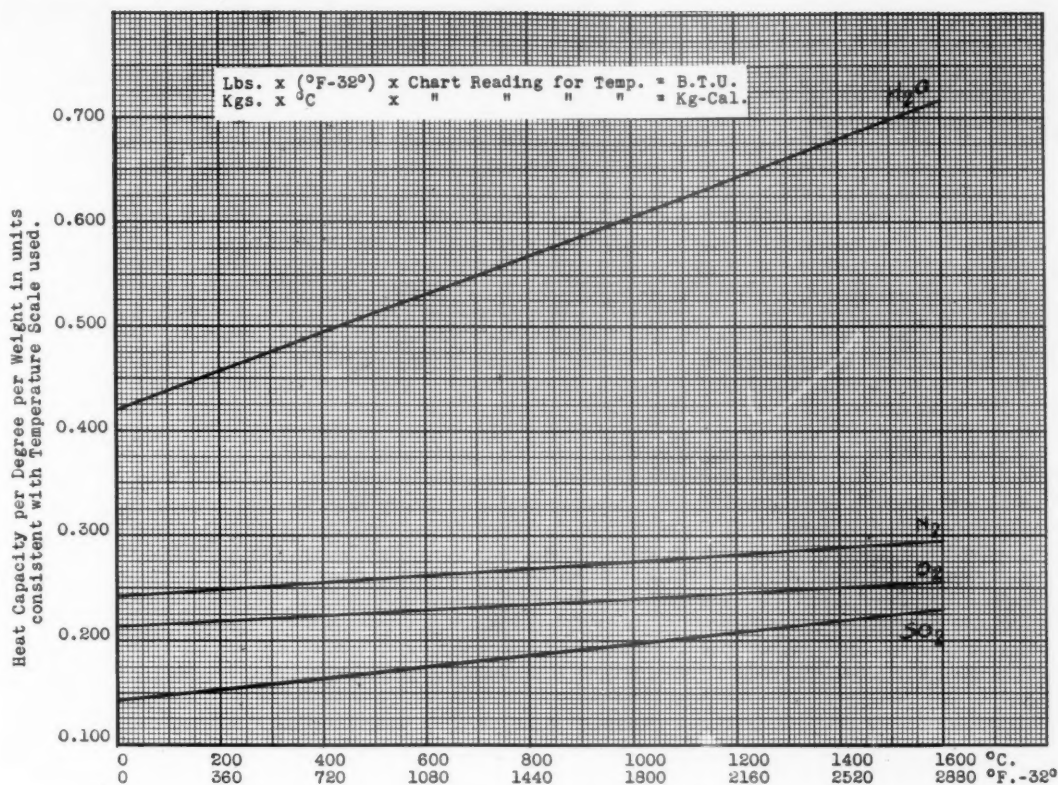


Chart III. Heat Capacities of Gases.

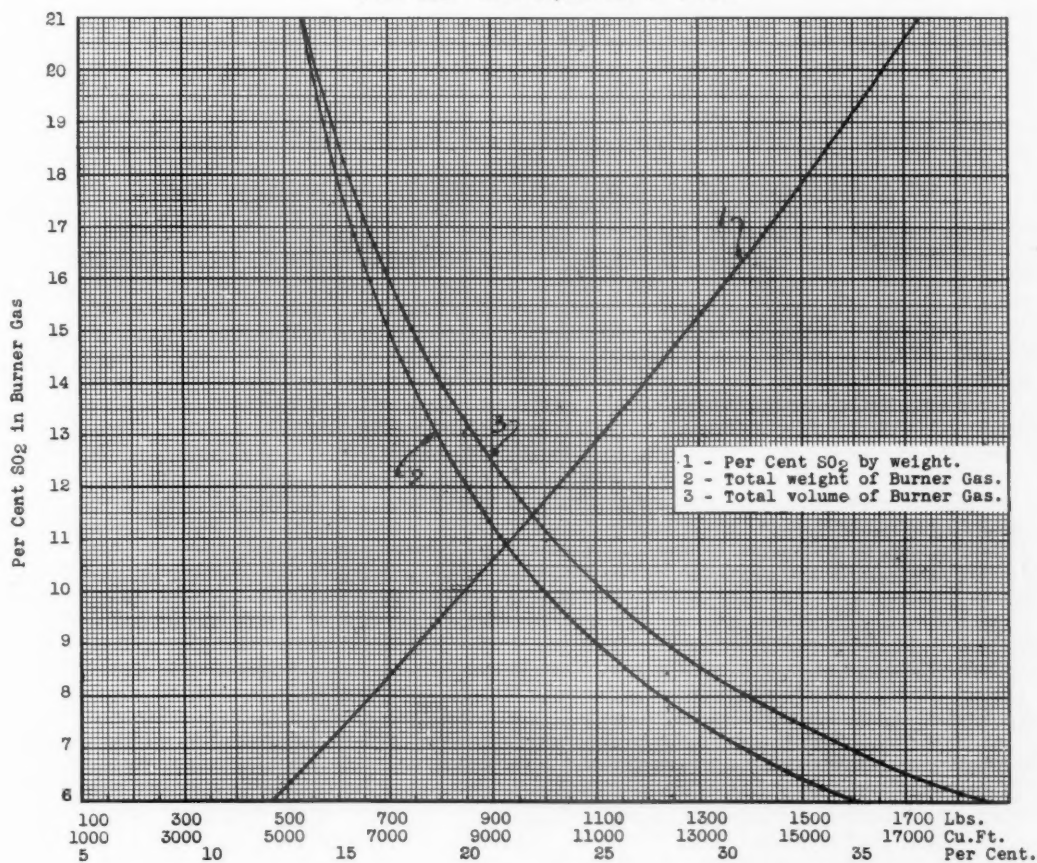


Chart IV. Weight and Volume of Burner Gas at S.T.P. Based on 100 lbs. of Sulphur. Gas Dry.

D. Conditions Favoring the Formation of Sulphur Trioxide

● Sulphur trioxide in burner gases may come from three sources.

- Decomposition of sulphuric acid present in commercial sulphur.
- Formation during actual burning of sulphur.
- Oxidation of the sulphur dioxide in the burner gases.

The first source accounts for a relatively small amount of the trioxide usually found in burner gases. Commercial sulphur usually contains sulphuric acid produced by atmospheric oxidation, but the amount is small. Dr. Kress reports that a typical analysis showed

0.05% sulphuric acid present in the sulphur. In terms of sulphur converted, this amounts to only 0.016%.

The amount of trioxide formed during the actual burning of sulphur is difficult to determine accurately. Undoubtedly it depends to a great extent upon the temperature attained. The proportion of excess air may be expected to have a considerable influence.

It is, therefore, not only good practice, but important, to produce as high a gas strength as possible.

The third source, oxidation of the sulphur dioxide, is by far the greatest source for formation of SO_3 in the burner gases.

Below is tabulated the theoretical per cent conversion at equilibrium of sulphur dioxide and sulphur trioxide as prepared by Dr. Kress⁵.

TABLE V.
Theoretical Per Cent Conversion at Equilibrium
of Sulphur Dioxide and Sulphur Trioxide

Temperature		Per Cent Conversion			
° C.	° F.	10.5% SO_2 10.5% O_2	14.0% SO_2 7.0% O_2	16.5% SO_2 4.5% O_2	19.5% SO_2 1.5% O_2
300	572	100.	99.	55.	15.
400	752	99.	96.	54.	15.
500	932	93.	85.	53.	15.
600	1112	72.	62.	47.	15.
700	1292	43.	36.	27.	12.
800	1472	21.	17.	14.	7.
900	1652	10.	8.2	6.5	3.6
1000	1832	5.	4.0	3.3	1.8
1100	2012	2.8	2.2	1.7	1.0
1200	2192	1.6	1.3	1.0	0.6
1300	2372	1.0	0.8	0.6	0.4
1400	2552	0.6	0.5	0.4	0.2

It is understood, however, that at a given temperature not all of the sulphur dioxide, as given in the table, will be oxidized. Instead the oxidation will take place only until a certain ratio of the trioxide to dioxide is produced.

The rate of reaction is of great practical importance. The rate is normally so low that equilibrium is not reached under commercial conditions of operations.

Certain catalyzers will, however, speed the reaction. It is, therefore, of interest to know that Dr. Kress found neither iron nor iron oxides efficient catalyzers.

The iron has to be changed over to other materials, such as sulphates, before the maximum catalytic effect occurs.

Calclines or iron oxides from pyrites roasting have little catalytic effect.

Under continuous operation of the conventional type unlined rotary sulphur burner the interior is covered with a layer of molten sulphur, but a conversion to trioxide of 1-2 per cent may be expected.

A burner lined with refractory brick will produce burner gases of lower sulphur trioxide content.

There may be occasional surges of sulphur trioxide formed while the burner is being started and brought to its production rate and while it is being burned down as then more iron is exposed and the temperature range, at which maximum sulphur trioxide formation occurs in the presence of iron, is passed through.

To fully eliminate trioxide formation is practically impossible, but with due care the conversion can be kept within the 1-2 per cent mentioned above.

Such a small conversion will hardly effect weight and volume of the burner gas.

Sulphur trioxide boils at 46° C. (115° F.). Through cooling of the gases below 46° C. the sulphur trioxide condenses and under 16° C. to a solid form as a fine mist, which even is difficult to dissolve in hot concentrated NaOH solution.

The wet Cottrell method is as yet the only satisfactory method with which to eliminate the trioxide from the burner gases. Very few mills have such an installation and the white smoke of SO_3 which arises from the towers is still the symbol of a sulphite mill.

IV. Burner Gas Calculations

● If not otherwise noted, all calculations are at standard temperature and pressure, 32° F. (0° C.) temperature and 14.7 lbs. (760 mm. Hg) barometric pressure.

All calculations are based on 100 lbs. sulphur.

A. Sulphur Burning (Dry air—no SO_3 formation)

Burner Gas	Mol. Wt.	Lbs. in 1 molal Volume	% Weight
17.0% SO_2	64	10.88	31.7
4.0% O_2	32	1.28	3.7
79.0% N_2	28	22.12	64.6
100.0% Gas		34.28	100.0

Thus: SO_2 by weight 31.7%

$$\text{Total weight burner gas} = \frac{200}{0.317} = 631 \text{ lbs.}$$

⁵Dr. O. Kress: Technical Association Papers, Series XVIII.

$$\text{Total volume of burner gas} = \frac{200 \times 359}{64 \times .17} =$$

6600 cu. ft.
1 cu. ft. burner gas 0.0956 lbs.
1 lb. burner gas 10.47 cu. ft.

The influence of moist air on the burner gas composition is given below for three representative days (See Table VI and Chart I).

32° F. Air Saturated = 0.004 lbs. Water Vapor per lb. Dry Air

62° F. Air Saturated = 0.012 lbs. Water Vapor per lb. Dry Air

74° F. Air Saturated = 0.018 lbs. Water Vapor per lb. Dry Air

0.004 lbs. Water Vapor per lb. Dry Air = 0.64% Vapor per Volume

0.012 lbs. Water Vapor per lb. Dry Air = 1.87% Vapor per Volume

0.018 lbs. Water Vapor per lb. Dry Air = 2.82% Vapor per Volume

Composition of Air			
H ₂ O	0.6%	1.9%	2.8%
O ₂	20.9%	20.6%	20.4%
N ₂	78.5%	77.5%	76.8%
	100.0%	100.0%	100.0%
Burner Gas Composition			
H ₂ O	0.6%	1.9%	2.8%
O ₂	4.0%	3.9%	3.9%
N ₂	78.5%	77.5%	76.8%
SO ₂	16.9%	16.7%	16.5%
	100.0%	100.0%	100.0%

B. Sulphur Burning (2.8% Water Vapor—No SO₃ Formation)

Burner Gas	Mol. Wt.	Lbs. in 1 molal Volume	% Weight
16.5% SO ₂	64	10.56	31.2
3.9% O ₂	32	1.25	3.7
76.8% N ₂	28	21.50	63.6
2.8% H ₂ O	18	0.50	1.5
100.0% Gas		33.81	100.0

Thus: SO₂ by weight 31.2%

$$\text{Total weight burner gas} = \frac{200}{0.312} = 641 \text{ lbs.}$$

$$\text{Total volume of burner gas} = \frac{200 \times 359}{64 \times .165} =$$

6800 cu. ft.
1 cu. ft. burner gas 0.0944 lbs.
1 lb. burner gas 10.59 cu. ft.

C. Pyrites Burning (Dry Air—No SO₃ Formation)

Burner Gas	Mol. Wt.	Lbs. in 1 molal Volume	% Weight
11.0% SO ₂	64	7.04	21.8
7.0% O ₂	32	2.24	7.0
82.0% N ₂	28	22.96	71.2
100.0% Gas		32.24	100.0

Thus: SO₂ by weight 21.8%

$$\text{Total weight of burner gas} = \frac{200}{0.218} = 917 \text{ lbs.}$$

$$\text{Total volume of burner gas} = \frac{200 \times 359}{64 \times .11} =$$

10200 cu. ft.

1 cu. ft. burner gas 0.0899 lbs.

1 lb. burner gas 11.10 cu. ft.

The influence of moist air on the burner gas composition, using same climatic conditions as under sulphur burning.

Burner Gas Composition

H ₂ O	0.6%	1.9%	2.8%
O ₂	7.0%	6.9%	6.8%
N ₂	81.5%	80.4%	79.7%
SO ₂	10.9%	10.8%	10.7%
	100.0%	100.0%	100.0%

D. Pyrites Burning (2.8% Water Vapor—No SO₃ Formation)

Burner Gas	Mol. Wt.	Lbs. in 1 molal Volume	% Weight
10.7% SO ₂	64	6.85	21.5
6.8% O ₂	32	2.18	6.8
79.7% N ₂	28	22.32	70.1
2.8% H ₂ O	18	0.50	1.6
100.0% Gas		31.85	100.0

Thus: SO₂ by weight 21.5%

$$\text{Total weight of burner gas} = \frac{200}{0.215} = 930 \text{ lbs.}$$

$$\text{Total volume of burner gas} = \frac{200 \times 359}{64 \times .107} =$$

10480 cu. ft.
1 cu. ft. burner gas 0.0888 lbs.
1 lb. burner gas 11.25 cu. ft.

V. Melting of Sulphur

● As mentioned under "Raw Materials" sulphur melts at 235.0° F. to a mobile liquid, but upon further heating becomes less and less mobile until at 392° F. it is so thick that it will not flow. This peculiar behavior necessitates care in the melting operation.

Melted sulphur is generally transported through steam jacketed pipe lines. The importance of temperature control is readily understood as if the sulphur is too cold or too hot the pipe lines are liable to "freeze." The temperature of the melted sulphur should be kept at, or slightly above, 248° F. (120° C.), the temperature at which sulphur ignites.

Melting Calculations

Data:

$$\begin{aligned} \text{Specific heat of solid sulphur} &= .1728 \\ \text{Specific heat of melted sulphur} &= .235 \\ \text{Latent heat of sulphur melting} &= 16.86 \text{ B.T.U.} \\ 100 \times (235-32) \times 0.178 &= 3613 \text{ B.T.U.} \\ 100 \times 16.86 &= 1686 \text{ B.T.U.} \\ 100 \times (250-235) \times 0.235 &= 353 \text{ B.T.U.} \\ \text{Heat in 100 lbs. melted sulphur} &= 5652 \text{ B.T.U.} \end{aligned}$$

VI. Technical Gas Data

A. Heat Capacities In Kilogram Calories Per Degree Per Mol

$$\begin{aligned} \text{SO}_2 \text{ Gas} &7.70 + 0.00530 T - 0.00000083 T^2 \\ \text{N}_2 \text{ Gas} &6.50 + 0.00100 T \\ \text{O}_2 \text{ Gas} &8.27 + 0.000258 T - 187700 \div T^2 \\ \text{CO}_2 \text{ Gas} &10.34 + 0.00274 T - 195500 \div T^2 \\ \text{H}_2\text{O Gas} &8.22 + 0.00015 T + 0.00000134 T^2 \\ &T = 273.1 + ^\circ \text{C.} \end{aligned}$$

Data from Chemical Engineers Handbook, second edition.

(See Table VII and Chart II).

TABLE VI.

Properties of Air Mixed With Saturated Water Vapor

° F.	° C.	Pressure of sat. vapor mm. Hg.	Weight of sat. vapor per lb. dry air	% Vapor by weight	Volume 1 lb. dry air cu. ft.	Volume 1 lb. dry air + vapor to sat. cu. ft.	% Vapor by volume	Total Heat Above 0° F. B.T.U.		
								of 1 lb. dry air	of vapor to sat. 1 lb. dry air	of 1 lb. sat. air
32	0.0	4.6	0.00378	0.38	12.39	12.47	0.64	7.72	4.06	11.78
40	4.4	6.3	0.00520	0.51	12.59	12.70	0.87	9.65	5.60	15.25
45	7.2	7.7	0.00632	0.63	12.71	12.85	1.09	10.86	6.82	17.68
50	10.0	9.2	0.00764	0.76	12.84	13.00	1.23	12.07	8.26	20.33
55	12.8	11	0.00921	0.91	12.98	13.17	1.44	13.28	9.99	23.27
60	15.6	13	0.01105	1.09	13.10	13.33	1.72	14.48	12.00	26.48
65	18.3	16	0.01323	1.12	13.23	13.50	2.00	15.69	14.41	30.10
70	21.1	19	0.01578	1.55	13.35	13.69	2.49	16.90	17.21	34.11
75	23.9	22	0.01878	1.84	13.48	13.88	2.88	18.11	20.53	38.64
80	26.7	26	0.02226	2.18	13.60	14.09	3.48	19.32	24.38	43.70
85	29.4	31	0.02635	2.57	13.73	14.31	4.06	20.53	28.93	49.46
90	32.2	36	0.03109	3.01	13.86	14.55	4.74	21.74	34.19	55.93
95	35.0	42	0.03663	3.54	13.99	14.81	5.53	22.95	40.39	63.34
100	37.8	49	0.04305	4.12	14.11	15.08	6.43	24.16	47.56	71.72
105	40.6	57	0.0505	4.79	14.24	15.39	7.48	25.37	55.95	81.32
110	43	66	0.0593	5.60	14.36	15.73	8.71	26.58	65.74	92.32
115	46	76	0.0694	6.50	14.49	16.10	10.00	27.79	77.16	104.95
120	49	87	0.0813	7.52	14.62	16.52	11.50	29.00	90.52	119.52
125	52	100	0.0953	8.70	14.75	16.99	13.18	30.21	106.2	136.41
130	54	115	0.1114	10.02	14.88	17.53	15.12	31.42	124.6	156.02
135	57	131	0.1305	11.54	15.00	18.13	17.26	32.63	146.2	178.83
140	60	150	0.1532	13.28	15.13	18.84	19.69	33.85	171.9	205.75
145	63	170	0.1800	15.25	15.26	19.64	22.30	35.06	202.4	237.46
150	66	192	0.2122	17.51	15.39	20.60	25.29	36.27	239.1	275.37
160	71	245	0.2987	23.00	15.64	23.09	32.27	38.69	337.8	376.49
170	77	310	0.4324	30.19	15.90	26.84	40.76	41.12	490.8	531.92
180	82	388	0.6577	39.68	16.16	33.04	51.09	43.55	749.2	792.75
190	88	483	1.0985	52.35	16.41	45.00	63.53	46.97	1255.7	1302.67
200	93	600	2.2953	69.65	16.67	77.24	78.42	48.40	2623.0	2671.40

Data from Chemical Engineers Handbook, second edition.

TABLE VII

Heat Capacities of Gases At Various Temperatures
In Kilogram Calories Per Degree Mol.

° C.	° F.	SO ₂	N ₂	O ₂	CO ₂	H ₂ O
10	50	9.13	6.78	6.00	8.68	8.37
100	212	9.56	6.87	7.02	9.86	8.47
200	392	10.04	6.97	7.55	10.77	8.59
300	572	10.47	7.07	7.85	11.32	8.75
400	752	10.89	7.17	8.03	11.75	8.93
500	932	11.30	7.27	8.15	12.13	9.14
600	1112	11.70	7.37	8.24	12.47	9.37
700	1292	12.07	7.47	8.32	12.80	9.64
800	1472	12.42	7.57	8.39	13.11	9.94
900	1652	12.78	7.67	8.43	13.42	10.24
1000	1832	13.10	7.77	8.48	13.72	10.59
1100	2012	13.41	7.87	8.52	14.01	10.96
1200	2192	13.71	7.97	8.56	14.29	11.36
1300	2372	13.99	8.07	8.59	14.58	11.77
1400	2552	14.24	8.17	8.63	14.84	12.23
1500	2732	14.48	8.27	8.67	15.14	12.71

A mol. of any substance is that quantity of the substance the weight of which in pounds, grams or any other convenient unit is numerically equal to its molecular weight. If expressed in pounds, it is called the pound-mol.; if in grams, the gram-mol.

Equal volumes of all perfect gases at the same temperature and pressure contain the same number of molecules. The molal volume of any gas at standard temperature and pressure (S.T.P.) 0° C. and 760 mm. Hg. or 32° F. and 29.92 inches Hg. is 22,412 cc. per gram-mol. or 359 cu. ft. per pound-mol.

Thus:

$$1 \text{ gram-mol.} = \frac{\text{weight in grs.}}{\text{molecular weight}} = \frac{\text{volume in cc.}}{22,412}$$

$$1 \text{ pound-mol.} = \frac{\text{weight in lbs.}}{\text{molecular weight}} = \frac{\text{volume in cu. ft.}}{359}$$

B. Heat Capacities In Kilogram Calories Per Kilogram Per Degree Centigrade

$$\begin{aligned} \text{SO}_2 \text{ Gas} & 0.1430 T + 0.000055 T^2 \\ \text{N}_2 \text{ Gas} & 0.2405 T + 0.000035 T^2 \\ \text{O}_2 \text{ Gas} & 0.2104 T + 0.000029 T^2 \\ \text{H}_2\text{O Gas} & 0.42 T + 0.000185 T^2 \\ T & = ^\circ \text{C.} \end{aligned}$$

To convert kg. calories per kg. to B.T.U. per pound, multiply with 1.8.

These data probably do not give as accurate results as the ones taken from Chemical Engineers' Handbook, second edition, but are easier to use (See Chart III).

C.

TABLE VIII.
Densities of Gases At Standard Temperature and Pressure

		Molecular Weight	Lbs. per cu. ft.	Cu. ft. per lb.
Air			0.0808	12.38
Carbon Dioxide	CO ₂	44.010	0.1225	8.16
Hydrogen	H ₂	2.016	0.0056	178.08
Nitrogen	N ₂	28.016	0.0781	12.81
Oxygen	O ₂	32.000	0.0891	11.22
Sulphur Dioxide	SO ₂	64.060	0.1786	5.60

D.

TABLE IX.
Weight and Volume of Burner Gas At S.T.P. Based on Burning 100 Lbs. of Sulphur. Gas Dry

Composition of Gas			% SO ₂ by Weight	Total Weight Burner Gas, lbs.	Total Volume Burner Gas cu. ft.	Dry Air Required lbs.	Dry Air Required cu. ft.
O ₂	N ₂ etc.	SO ₂					
15	79	6	12.43	1609	18667	1509	18667
14	79	7	14.35	1394	16000	1294	16000
13	79	8	16.23	1232	14000	1132	14000
12	79	9	18.11	1104	12444	1004	12444
11	79	10	19.89	1006	11200	906	11200
10	79	11	21.68	923	10182	823	10182
9	79	12	23.42	854	9333	754	9333
8	79	13	25.12	796	8615	696	8615
7	79	14	26.79	747	8000	647	8000
6	79	15	28.43	703	7467	603	7467
5	79	16	30.04	666	7000	566	7000
4	79	17	31.62	633	6588	533	6588
3	79	18	33.17	603	6222	503	6222
2	79	19	34.69	577	5900	477	5900
1	79	20	36.19	553	5600	453	5600
---	79	21	37.59	532	5346	432	5346

(See Chart IV)

E.

TABLE X.
Weight and Volume of Burner Gas At S.T.P. Based on Burning 200 Lbs. of Pyrites (50% Sulphur). Gas Dry

Composition of Gas			% SO ₂ by Weight	Total Weight Burner Gas, lbs.	Total Volume Burner Gas cu. ft.	Dry Air Required lbs.	Dry Air Required cu. ft.
O ₂	N ₂ etc.	SO ₂					
13.34	80.66	6	12.45	1606	18667	1541	19060
12.06	80.94	7	14.38	1391	16000	1326	16393
10.80	81.20	8	16.27	1229	14000	1164	14393
9.51	81.49	9	18.16	1101	12444	1036	12837
8.23	81.77	10	19.95	1003	11200	938	11593
6.95	82.05	11	21.76	919	10182	854	10575
5.68	82.32	12	23.51	851	9333	786	9726
4.41	82.59	13	25.23	793	8615	728	9008
3.13	82.87	14	26.92	743	8000	678	8393
1.85	83.15	15	28.58	700	7467	635	7860
---	83.60	16.4	30.85	648	6829	583	7222

(Note: 100 lbs. sulphur requires 34.93 lbs. O₂ for oxides ⇒ 393 cu. ft. O₂)

New St. Helens Employees Are First Trained by Safety Engineer

by CHESTER B. GILLIHAN*

THERE are several features of our safety program here at St. Helens that are paying real returns in saving manpower and increasing the efficiency and the output of our plant. We don't claim to be first in any of these things we are doing, although I do not believe there are many other pulp and paper mills which have given them a tryout as yet.

We know that in our own vicinity we are the first industrial plant of any kind to introduce armed women guards, trained in gunnery and jiu jitsu, and we think we are one of the first to have women fire fighters.

At any rate, here are four features of our safety program that we think are somewhat unusual in this industry:

1. Even before he meets his foreman, each new St. Helens employee is introduced to his job by the safety engineer and given instruction in safety practices.

2. Our company is very liberal in furnishing face shields, gloves and other safety equipment, mostly gratis, to helpers as well as those directly engaged in dangerous work.

3. Our fire fighting squads are also trained in first aid and air raid emergency work, thus saving in manpower and streamlining all safety work in the plant.

4. Women are not only plant guards but are on the fire fighting squads, taking their place alongside the men, and also are trained in various emergency types of activity.

Before I go any farther, let me stress the point that none of these innovations would have been introduced at St. Helens if it had not been found to be practical and useful by Mr. Max Oberdorfer, our President. No one is more keenly aware than he is that good safety practices are good business and many times on his rounds of the plant he has stopped to instruct an employe in some safety practice.

It is my duty to take in charge each new employe as he passes through the time office. I conduct him to his job. I give him instruction on our safety program as it applies to his particular job and hand him our little book of safety rules.

Men and women going to work for the St. Helens Pulp & Paper Company are introduced to the job by the safety engineer, who trains them first of all to work safely.

The St. Helens safety program includes a number of useful ideas which assist employes in their work, save manpower and increase efficiency.

This is a book of "Dos" and "Don'ts" for each department. For instance, it says "do not stand flats on edge" in the finishing department and "do not grind on grinding wheels without goggles." After the employe has been given his lesson in safety, I introduce him to his particular foreman and I report to the foreman that this employe understands the principles and aims of our safety program.

In the matter of safety equipment, the company furnishes gratis all rubber gloves, goggles, face shields, respirators and various other articles. The employe must pay for equipment only in event he needs safety shoes and in this case he only pays the cost of the shoes.

Not only are millwrights furnished with the necessary grinding, chipping and welding goggles, but even the helpers in the mechanical departments are furnished goggles to protect them from flash burns in areas where electric welding is being done. We find it pays to pass out a few more goggles, for instance, than are absolutely necessary.

Jim Fowler, our chief guard, is the organizer and chief of our fire department, under the general supervision of C. V. Smith, chief en-

gineer. The teaching of the fire fighting squads in various lines of emergency training is done by Mr. Fowler and myself.

We have 100 men and women in the fire department. All of them have had at least emergency first aid training as well as fire fighting and other instruction. In larger industries, it may still be possible to engage workers separately for fighting fires and for membership on first aid teams and for air raid duty. We have about 600 employes and a large proportion of these are women. We must have fire squads that are versatile and can do other emergency jobs.

We have four squads of 25 men and women to each squad. There is one squad on duty on each of four shifts, giving the plant 24-hour, around-the-clock protection. Leaders chosen for each squad are the backenders on paper machines. They are Henry Jewell, Raymond Erickson, William Howard and Maurice Murray.

For membership on these combined fire-first aid-air raid squads, we have drawn only men and women who can really be spared temporarily from their jobs in event of any emergency. We don't take any key men, for instance, but the next man to the key man on any machine is usually a good level head for squad duty. We pick our men and women so that we can get a squad together on short notice without stopping any machines or crippling any department. There are no "honorary" appointments to our fire squads. No member has any excuse for not showing up when an emergency occurs or he is called for duty.

I want to give credit to the women, too. They grab a hose just like a man and have proved they are not the least bit afraid of it.

Members of the fire department are given a variety of instruction, as follows:



CHESTER B. GILLIHAN, Safety Engineer, and JAMES FOWLER, Chief Guard (right), are in charge of the safety, fire protection and first aid instruction given St. Helens Pulp & Paper Co. Employes.

*Safety Engineer, St. Helens Pulp & Paper Co., St. Helens, Ore.

1. Fire fighting.
2. First aid.
3. Evacuation.
4. Air raid wardens.
5. Demolition and shoring.
6. Gas training.
7. Decontamination.
8. Bomb reconnaissance.
9. Auxiliary plant guards.

At any fire, we figure that at least one or more persons from the squad can be spared to do first aid work. In addition, we have a full time nurse at the plant and a well equipped first aid station.

We have four qualified instructors of first aid. They are Jim Fowler, chief guard; Henry Jewell, back-tender and one of the squad leaders; M. E. McMichael, electrician, and myself.

Many members of the fire squads already have earned both advance and standard first aid cards. The balance have had special first aid training.

With more green employees and, especially, more women, being employed nowadays, we are putting more emphasis on safety than ever before.

Two West Linn Veterans Pass Away

Two veterans of the Crown Willamette Paper Company of West Linn, Ore., have passed. They are Guy E. Reddick, foreman of the sawmill at the Oregon City plant, who died December 15 after a heart attack, and Duncan M. Shanks, retired fire chief, who succumbed December 31. As we go to press, there had been no one appointed to replace Mr. Reddick.

The death of Mr. Shanks recalled pioneering ventures in pulp production in the Pacific Northwest for he was an employee of the first groundwood mill in Oregon, which started operations in 1885 at Young's River Bay at Astoria, Ore. It did its own logging with oxen and it had four grinders—first in Oregon—with five pockets to a stone. The pulp was shipped by barge to Stockton, Calif., for manufacture. At the Chicago 1894 World's Fair this pulp took a first prize and Mr. Shanks kept the bronze medal many years.

Mr. Shanks, who was born in Chatham, Ontario, Nov. 19, 1862, went to work in this mill in 1888 on his 26th birthday. He married the boss' daughter—the boss was R. M. Brayne—and in 1905, when the mill was dismantled, he was transferred to West Linn. Both were Crown Zellerbach divisions of that day.

At West Linn, Mr. Shanks became fire chief. He received a 50-year service pin from Louis Bloch, chairman of the board of Crown Zellerbach, going to San Francisco from West Linn for the presentation on November 19, 1938, his 76th birthday.

Mr. Reddick, born in Portland, Ore., would have been 59 years old had he lived till February 21. He started in the West Linn sawmill in July, 1898, and in 1915 was promoted to foreman. He was serving in that capacity when he died. His widow and a son and daughter survive.

Mill Men Join Services, Many Promoted, Win Medals

● A steady drain of men going into the armed services of Uncle Sam continues from the West Coast pulp and paper mills. Many technical, college-trained men are being lost as they go into officers' training. In recent weeks there seems to be more specializing among men going into uniform. Among those who entered service early in the war, many have reached high officers' rank.

Word has reached the Camas mill of Crown Willamette Paper Company, division of Crown Zellerbach Corp., of promotions of two of their men. William Hart, who was in the mill order department, has risen from major to lieutenant colonel in the Army, serving in the selective service organization in Washington, D. C. Leland F. Maybach, who was steam plant engineer, has advanced from captain to major in the artillery.

T. M. Huddleston, a pulp and paper tester at the Hawley mill in Oregon City, was promoted from captain to major at the Edgewood Arsenal in Maryland. Another Hawley man, Vernon Tipka, who was well known in Pacific Coast Tappi circles, is in the quartermasters' officers training corps at Fort Francis Warren in Wyoming.

At Camas, where the staffs run heavily to college men, who have more opportunities for commissions open to them, there has been almost a mass withdrawal of engineers and technicians. As we go to press, there were 29 gone out of the Camas technical laboratory, nearly fifty per cent of Supervisor George H. Gallaway's crew. (Incidentally, Gallaway has a brother in the army in French North Africa.) About ten of these Camas technicians have become officers. There are eight women in the lab now in some of their jobs.

Francis W. Flynn, who was in charge of the lab work for the sulphite mill and filter plant, and Chester Beals, kraft mill chemist, reported at Ithaca, N. Y., Jan. 1, to enroll in the naval officers' training at Cornell University.

Bill Ashe, beater room foreman; Stewart H. Lawrie, back tender of No. 12 paper machine; Cecil Templar, machinist in defense work; Joe B. Emily, construction foreman, and Talbert B. Preuit of the technical department, all left the Camas mill in the past month to join the Seabees, the navy's fighting construction battalion.

Ashe went to Norfolk, Va., as a chief petty officer as he had had three years of active duty in France in the last war, running away from his home in Ireland to join the English army at the age of 15. He formerly worked in the Ocean Falls, B. C., mill.

Flynn is going to be missed at the Camas paper school where he was professor in charge of the first year class. The faculty honored him with a farewell luncheon at which A. G. Natwick, assistant resident manager of the mill and dean of the school, was toastmaster. Flynn's wife went to work in the mill office January 4, a week after he left for the east.

Flynn came west from Minnesota, where he obtained a chemical engineer's degree at the state university and earlier attended St. Thomas College in St. Paul. His place at the school is being taken by Walter Jacoby, who is now the assistant technical supervisor in the Camas mill. His younger brother, Bernard Jacoby, left the technical department to go

into army officer's training in Maryland.

Forrest Williams, sulphite engineer at Camas, went to Fort Lewis in mid-December to enter army officer's training, also.

New Year's week-end visitors at the technical department were former staff members Sgt. James Butterick and Corp. Walter Rich, both in the army. Also back home on 30-day furlough from Gaudalcanal was Sgt. Warren Knuth of the marines, former student in the mill's paper school, who went into the army at the age of 19. He is a technician with the marine aircraft wing, and his outfit, flying Grumman pursuit planes, went into Henderson field in Gaudalcanal as soon as ground forces chased Jap flyers out, he said.

Another Camas hero has turned up in Machinist's Mate Carleton M. Beck, former steam plant employee, who was awarded the navy and marine corps medal for bravery, his citation being signed by Admiral R. A. Theobald.

The citation stated that he repaired damage in the aft engine room of his navy ship while it was under attack from an enemy submarine and enabled his ship to proceed and escape further attacks. Anyone in an engine room of a ship under torpedo fire, it would seem, certainly deserves a medal.

Bellingham Union Holds Children's Party

● Local 194 of the International Brotherhood of Pulp, Sulphite & Paper Mill Workers, Bellingham, entertained the children of members at a Christmas theater party in Bellingham.

The program included cartoon comedies, animal shorts and other interesting features. Santa Claus distributed stockings filled with candies and toys to each child.

Pete Anderson arranged the party for the union members.

Puget Sound Declares Preferred Dividend

● Regular quarterly dividend of 30c a share on the preferred stock of Puget Sound Pulp & Timber Co. has been declared, payable January 1, 1943, to stockholders of record December 16, 1942.



FRANCIS W. FLYNN Joins Naval Ordnance.

Oregon Manpower Chief Praises Pulp and Paper Industry

● L. C. Stoll, war manpower chief for Paul V. McNutt in the state of Oregon, told the labor-management committee of his state commission at a meeting in Portland January 6 that the Oregon-Washington pulp and paper industry merited high praise for its voluntary manpower release agreement.

He said similar agreements should be made in other major industries of the west coast.

Under the program of the pulp and paper industry, which was inaugurated in September, the highest skill of workers was to determine where they would be employed—either in the pulp or paper mills or by going to direct war industries. They would leave the mills only if there was a need for their skills.

Mr. Stoll said several hundred skilled men had been transferred to key jobs in direct war production work from the pulp and paper mills. Inquiries at a number of mills by this magazine had indicated thus far there were not many demands being made for skilled workers by the United States Employment Service.

Mr. Stoll, in his talk, said:

"The U. S. Employment Service for Oregon has been quietly calling men into its offices on the basis of job experience indicated in their selective service occupational questionnaires. These men have been asked to voluntarily transfer to essential work. There have been many who have done so. But the great stumbling block in other industries to date has been the lack of provisions for restoration of seniority rights after the war as are provided for under the manpower release plan of the pulp and paper industry."

At this meeting Mr. Stoll's committee voted to make a survey of the shipyards to see whether manpower is being wasted.

Otto Hartwig, who is in charge of the pulp and paper industry's program, was invited to explain this whole program at a future meeting of the committee. In recent weeks Mr. Hartwig made a swing around the circuit of Washington state pulp and paper mills to check up results of the program with government officials and mill executives and union groups who were wondering about the plan's success.

In Seattle in early December, Mr. Hartwig reported to the Washington Manpower Commission that the pulp and paper industry was voluntarily readjusting its labor difficulties due to the drain upon manpower without raiding the common labor pool of war industries. He said there had been a loss of 2,000 male employees of Washington and Oregon pulp and paper mills since July to the military services and direct war industries. Some of these had gone into the pulp and paper mills' own machine shops, he said, where they are engaged in important war work finishing rudder assemblies, valves, winches and castings and other heavy materials for aircraft carriers, Liberty ships, invasion barges and other ship construction.

He said about 500 women had been employed to replace part of the losses in the less essential divisions of mill work.

Kennedy and Utter Elected Officers of Pacific Paperboard

● A reorganization meeting of the Pacific Paperboard Company of Longview, Wash., was held January 11 at the plant offices.

Thomas J. Kennedy, one of the younger executives of the company whose boyhood home town was Longview, was elected secretary-treasurer, succeeding Wray D. Farman, who returned to Sand Point, Ida., to take care of mining and insurance business left by a partner there who went into service.

Kennedy joins E. E. Flood, president, and Arthur C. Zimmerman, vice president and manager, as one of the three directors of the company. Kennedy continued in charge of sales.

Lloyd E. Utter, who was California representative in San Francisco, was elected a vice president and will have offices in Longview.

E. W. Truman and F. E. Geiger were elected assistant secretaries.

Kenneth W. Gordon, who was shipping superintendent, was named production manager. Ralph Mason, chief engineer, William Ball, master mechanic, and other plant officials were retained in their positions.

George McGregor Joins U. S. Forest Products Lab.

● George H. McGregor, who resigned as superintendent, Longview Mill, Pulp Division Weyerhaeuser Timber Co., on December 1st, left Seattle on January 7th for Madison, Wisconsin. Mrs. McGregor and their daughter accompanied him.

Mr. McGregor will become associated with the Division of Pulp and Paper of the U. S. Forest Products Laboratory at Madison, and will devote his time to special research work. In moving to Madison, the McGregors are returning to the city where they lived while he was studying for his masters degree in chemical engineering during 1928-1929. He also took his undergraduate work there.

Before leaving Longview Mr. McGregor was presented with a printed scroll by members of Local 153 of the International Brotherhood of Pulp, Sul-

phite & Paper Mill Workers, which read, "At a meeting of Weyerhaeuser Pulp Division employees held at Longview, Washington, December, 1942, a resolution was offered and unanimously adopted that the thanks of these employees are due and are hereby tendered to our outgoing superintendent, George H. McGregor for the square deal and congenial manner in which he filled the office as superintendent of the employees as listed, during the past five years." This was followed by the names of 84 members of the union. A committee presented it on January 6th, just before the McGregors left Longview.

Carlisle P. Winslow is a director of the Forest Products Laboratory, United States Department of Agriculture, Forest Service, and G. H. Chidester is chief, Division of Pulp and Paper. The laboratory, which is operated in cooperation with the University of Wisconsin, is fully equipped for research and development work in pulp, paper and board.

Camas Girls Win At Basketball

● The Crown Willamette Paper Company, division of Crown Zellerbach Corp., at Camas, Wash., has a girls' basketball team which had run up a string of five straight victories in a Portland girls' league as this issue went to press. It looks like the Camas mill has a real ball club and followers of the team say the girls "play a man's style of game."

They won their fifth straight game by beating the Electric Steel Casting Company girls team of Portland, Ore., by a 23 to 16 score. All of the Crown girls have worked in the mill and four members of the squad are still employed there. Their basketball suits and equipment were furnished by the mill.

Bob Fairweather Presented 35-Year C-Z Service Pin

● Robert T. (Bob) Fairweather, veteran in the accounting department of Crown Zellerbach Corp., San Francisco, is the proud possessor of a 35-year Service Pin, presented by Louis Bloch, chairman of the board, who personally has presented Bob with his last four pins.

Also, he was guest of honor at a recent luncheon arranged by fellow workers in his department in appreciation of long and faithful service.

In charge of auditing expense accounts, it has been claimed that Mr. Fairweather accurately can spot a phony entry in a "swindle sheet" at greater distance than any man alive. Yet salesmen whose vouchers through the years he has most severely sliced hold him in high esteem, and Chairman Bloch, presenting the service pin, pointed to him as one of the valuable men in the organization.

ON THE COVER

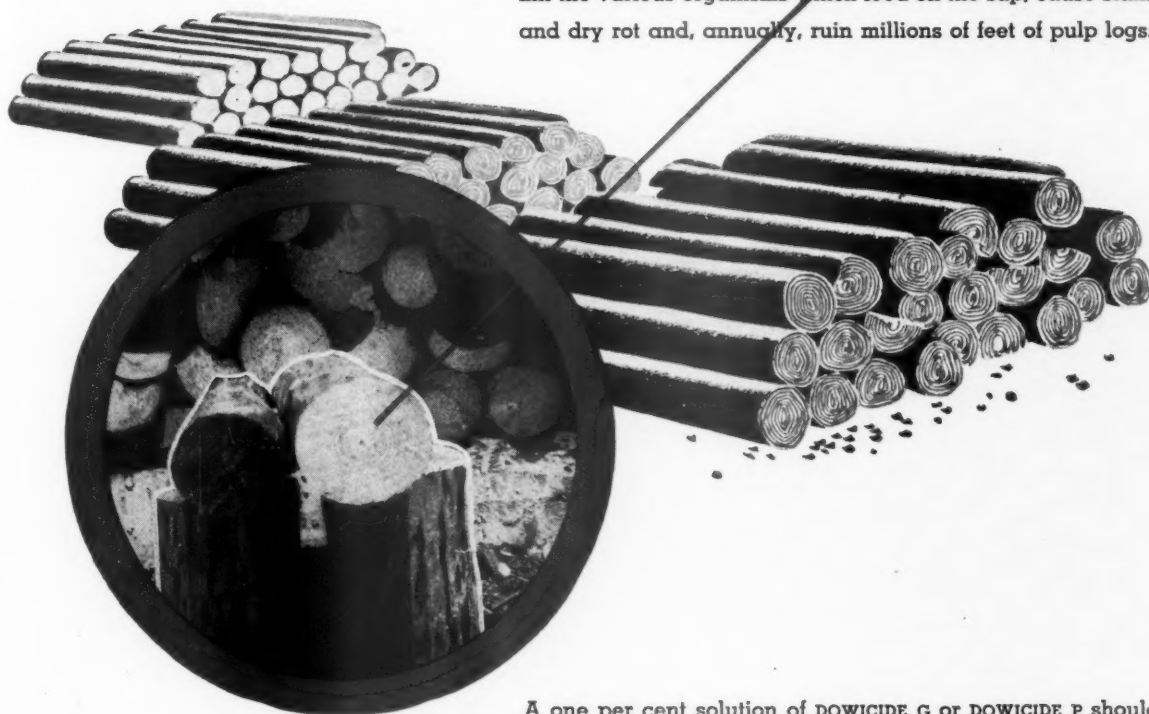
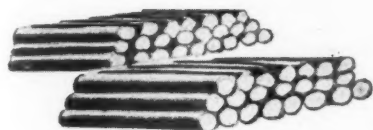
is pictured Lorina M. Hedges, one of the four women guards at the main gate of the St. Helens Pulp & Paper Company, St. Helens, Oregon.

Replacing men who have joined the services, the women have been trained in jiu jitsu and the handling of their 45-caliber revolvers by Jim Fowler, chief guard.



GEORGE H. MCGREGOR Joins
Forest Products Laboratory

How to safeguard valuable pulp logs in storage



Pulp log at left untreated—log at right protected by dipping in 1% Dowicide solution.

Pulp logs in storage are effectively protected from the destructive action of stain and decay with DOWICIDE* products. These powerful industrial germicides and fungicides kill the various organisms which feed on the sap, cause stain and dry rot and, annually, ruin millions of feet of pulp logs.

A one per cent solution of DOWICIDE G or DOWICIDE P should be applied as soon as possible after cutting, preferably within 24 hours. Treating can be done in the woods or at the time of unloading the logs at the banking location.

Other Protective Services Provided by Dowicide:

For the preservation of lap and pulp stock—DOWICIDE F or G. For longer felt life—DOWICIDE G. For the preparation of mold-resistant paper products—DOWICIDE A, B and G. For the prevention of decay and termite attack—DOWICIDE G. For controlling slime conditions—various combinations of DOWICIDE with other materials. For reducing maintenance costs—DOWICIDE 7, preserves structural timbers; DOWICIDE 6, protects paint film from mold growths.

For complete information on how to safeguard valuable pulp logs in storage, write to Dow requesting DOWICIDE Bulletin No. 42.

GREAT WESTERN DIVISION • THE DOW CHEMICAL COMPANY

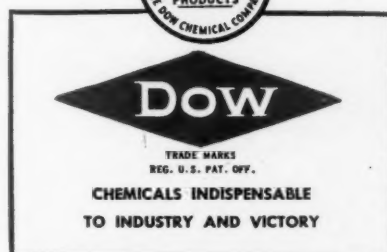
SAN FRANCISCO, CALIFORNIA
Seattle Los Angeles

*Trade Mark Reg. U.S. Pat. Off.



DOWICIDE

GERMICIDES AND FUNGICIDES



Establish Crown Zellerbach Quarter Century Club

UNIQUE in the realm of employee organizations is the "Quarter Century Club" of the Zellerbach Paper Co., formally launched at a dinner meeting in the Green Room of San Francisco's Hotel St. Francis on the evening of January 6th.

With membership limited to San Francisco and Headquarters offices and restricted to those who have been in continuous service of the company for 25 years or more, the charter membership roll contains 42 names, of whom five are women.

Each member received a 25-cent piece minted in the year in which he celebrated his 25th anniversary with the company, and a password was given out, with admonition that it be used only within the group.

Service pins were presented to several, among them Victor E. Hecht, George Holloway and Henry Mitchell, who received emblems attesting 35 years of service; T. J. Finerty, 30 years, while Harold L. Zellerbach, president of the company, and Paul Edstrom each received 25-year pins.

President Zellerbach was presented with his service pin by his brother, J. D. Zellerbach, who succeeded their father, the late Isadore Zellerbach, as president of Crown

Zellerbach Corp. The Zellerbach Paper Co. is a wholly-owned subsidiary of the corporation. Within the organization 5,500 employees have received service pins, indicating continuous service of five years or more, and of that number 350 have had continuous service for more than 25 years.

Eugene A. Breyman, vice president in charge of general operations and administration of Zellerbach Paper Co., acted as master of ceremonies at the organization meeting of the Quarter Century Club, and King Wilkin, assistant to the president, served as historian. Among guest speakers was Louis Bloch, chairman of the board of Crown Zellerbach Corp.

Five charter members were unable to be present, due to illness or absence from the city, but those in attendance represented a grand total of 1408 years of service with the company, an average of 33½ years per person.

Charles E. Burgess, who boasts 46 years with Zellerbach Paper Co., is the veteran on the membership roll, having joined the company in 1896, nosing out by one year Henry H. Zellerbach, who became actively affiliated with the company in 1897.

Third in line is Louis A. Colton, vice president in charge of the purchasing department, whose tenure of service dates back to 1898.

Other charter members, in the order in which they joined Zellerbach Paper Co., are:

1899—James R. Davis.
1903—Sumner C. Caldwell and Frank C. Stratford.

1904—Milton L. Colton, Walter Eva and George Johnston.

1905—August L. Sundberg.

1906—Sadie Callahan, Albert F. Neumann and James Van Pelt.

1907—Solomon Friedenberg, Victor E. Hecht, George Holloway, Henry Mitchell and William Weston.

1908—Edward W. Smith and James A. Woodside.

1910—Victor Barr, Frank Corrigan and Marie Fitzsimmons.

1911—John Dockrell, Felix Korn and Irvine Neubauer.

1912—Adelheid C. Bundesen, Edward Falk, Thomas J. Finerty and Martin W. Levy.

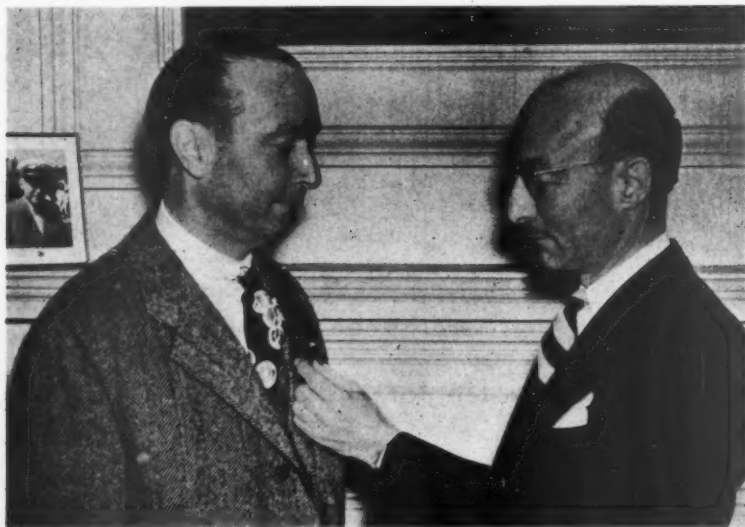
1913—Carl Conrad, George Montgomery and Elizabeth Sherman.

1914—Clyde Higgins and James D. Zellerbach.

1915—Leo Schoenfeld.

1916—Lillian Rehn and Frank Sidari.

1917—Charles I. Clay, Paul Edstrom, Benjamin Hertzberg and Harold L. Zellerbach.



HAROLD L. ZELLERBACH, President, Zellerbach Paper Co. (left), receives a 25-Year Service Pin, qualifying him for membership in the new "Quarter Century Club" from his brother, **J. D. ZELLERBACH**, President, Crown Zellerbach Corp.

Seen over the former's shoulder is a picture of their father, the late **ISADORE ZELLERBACH**, in yachting uniform, one of the founders of the paper corporations which bear his name.

Kelly Speaks Before Camas Paper School

● W. Norman Kelly, manager of the Longview Mill, Pulp Division, Weyerhaeuser Timber Company, Longview, Wash., was scheduled to discuss the manufacture of sulphite pulp under war conditions at the Camas Paper School on Jan. 7.

Despite heavy enlistments in military services, the school is going to carry through its classes to March 4, when it recesses till fall.

Twenty women are in the first year class, as a result of the unusually large number of women in jobs in the mill. The number of graduates and former students of the school in the services totaled 104 as of January 1.

Nylund and Hassell Enter Military Service

● Herbert E. Nylund, of the accounting department, Crown Zellerbach Corp., San Francisco, has been commissioned a lieutenant (j.g.) in the Navy, and is stationed at Quonset Point, R.I. Henry Hassell, of the sales department, recently reported to Monterey for service as a private in the Army supply department.



No Compromise



Rayonier is now producing pulp in greater volume than ever before. In war time as in peace time, there is no compromise with quality. Rayonier continues to produce "Better Pulps for Better Performance" for the manufacture of war materials and consumer goods.

RAYONIER

Mills: Hoquiam, Port Angeles, Shelton, Tacoma, Wash. and Fernandina, Fla. • Executive Offices: 343 Sansome Street San Francisco • Sales: 122 East 42nd Street, New York

Trade Talk



of Those Who Sell Paper in the Western States

"You're In the Army Now Mr. Jones"

● Howard Jones, on leave for the duration from Zellerbach Paper Co., San Francisco, where he combined official duties with serving as president of the Recreation Club, is a husky hunk of manhood, and a bit like "Mr. Five-by-Five."

When recently he reported for Army service at Monterey, he enjoyed a snigger at the expense of Uncle Sam. They had no trousers to fit him, and far be it from Private Jones to attempt to "dignify" military maneuvers by appearing for parade sans pants.

While he relaxed for a week or so, Army tailors sweated, fashioning a pair of breeches to encase the manly body of a soldier who will need be a super-man to half live up to prophecies voiced by former fellow workers at Zellerbach's. His hundreds of friends are hopeful his new trousers are as fine fitting as they know his military record will be.

Miss Marion Crapper Announces Engagement

● Wedding bells will ring this summer for Miss Marion Crapper, secretary to E. A. Breyman, vice-president in charge of operations and administration, Zellerbach Paper Co., San Francisco, for 13 years a valued employee of that organization.

Miss Crapper also is president of San Francisco Chapter of the California Credit Union League. Her husband-to-be, Louis Semas, is president of San Jose Chapter, and it was at a credit conference that Dan Cupid fired a couple of well-aimed and effective darts.

Two Sundbergs In the Service

● Some families are born to be patriotic, the more interesting when they spring entirely from the paper industry.

Jack Sundberg, on leave from the sales department of Crown Zellerbach Corp., San Francisco, who enlisted in the Army Air Corps April 17, last year, has won his wings after graduation from the officers' training school at Roswell, N. M. Commissioned a second lieutenant, he last was reported in the Salt Lake City, Utah, "pool," awaiting assignment for active duty.

His sister, Ruth Jane Sundberg, a New Year's graduate from Smith College, North Hampton, Mass., is an Ensign in the WAVES, formerly a stenographer in the San Francisco office of the Zellerbach Paper Co.

Their proud father, August L. Sundberg, has just rounded out his 38th year with the Zellerbach Paper Co., now in the administrative department, and their mother was a Zellerbach employee from 1911 until 1916, when she became Mrs. Sundberg.

Pacific Coast Paper Mills Sends New Year's Poem

● To customers and other friends of the organization the Pacific Coast Paper Mills of Washington, Incorporated, sent the following Christmas and New Year's poem signed by the president, J. J. Herb, the vice president, F. J. Herb, and the secretary, Victor A. Hughes. The complicated OPA pricing formulae for toilet tissues prompted F. J. Herb to write it.

MERRY CHRISTMAS—HAPPY

NEW YEAR

"With L-120, Schedule VI, we found ourselves in a sorry fix.

Then M.P.R. 266 added a pair of resounding kicks.

Production, too, has been curtailed. It's hold her down or else—be jailed!

Though Allocation Symbols failed, Controlled Materials Plan is hailed.

While OPA controls each price, WPB still shakes the dice.

With painful care we do things twice, only to find it won't suffice.

Joe Ration sits in the driver's seat; he holds the reins or we face defeat.

No more tires, much less meat. We have SOME coffee—it can't be sweet.

It's less of this and less of that; share your car and melt your fat.

Use less butter, wear one hat—The U. S. A. has gone to bat!

Despite the lack of goods we need, there still are ceilings we may exceed.

No limit on Friendship must we heed, promoting Good Will lacks no seed.

We try to please, nor will we cease—there's no rating needed for elbow-grease.

Best wishes will never be stamped "lend-lease"—

So here's to Happiness, Joy, and . . . PEACE!"

Tacoma Paper & Stationery Becomes Blake, Moffitt & Towne

● The Tacoma Paper & Stationery Company, established in 1909 by Frank E. Jeffries and associates, became the Tacoma Division of Blake, Moffitt & Towne on January 1st. Since its founding the Tacoma firm has acted as agent for Blake, Moffitt & Towne. The latter organization was formed in 1855 and in point of service is one of the oldest continuing organizations on the Pacific Coast.

Business will be continued at the present location and the present officers will remain in their same capacities, at least for the duration. Besides Mr. Jeffries as president, the officers are: Lyman Hall, vice president; and A. B. Coulter, secretary-treasurer.

Hagstrom Commissioned In the Navy

● Leonard Hagstrom, on leave from the Silklun Corp., Los Angeles, has been commissioned a lieutenant (senior grade) in the Navy, and is in San Francisco awaiting orders.

Towey Joins Office of Civilian Supply

● J. P. Towey, assistant sales manager of Crown Zellerbach Corp., San Francisco, left late in December for Washington, D. C., to fill an important post in the Office of Civilian Supply, War Production Board. He is on leave from his former position.

Breyman Writes Zellerbach Men In Service

● "They're all my boys, and I'm proud of them" is the way E. A. Breyman, vice-president in charge of operations and administration, Zellerbach Paper Co., San Francisco, thinks of the 170 former employees of the company now in service. And, insofar as being kept acquainted with what's going on around the office, they might as well be sitting across the desk from "The Chief."

Each month Mr. Breyman writes a personal letter to "his boys" . . . just a gossipy, homey letter, telling them what is going on, information about business, what he's done and what he's seen on the home front . . . letters such as fathers would (or should) write to their sons.

Of course, eventually they're mimeographed, but none the less personal, because a typed letter to each would overtax manpower in these days when so many erstwhile stenographers have become shipbuilders.

British Hope Esparto Shipments Will Be Resumed

● British papermakers, many of whom have made fine papers from esparto grass from North Africa, are wondering if shipments might soon be resumed since most of that area is now under control of Allied armies.

A writer in the December 4th issue of "The World's Paper Trade Review," says, "The war is moving into place names well known to all makers of esparto papers. It makes one wonder how soon it will be until we hear of cargoes of esparto putting into port. It may not be so long, because the gathering of the grass is a recognized living in Tunisia; and if a quick turn-round of the cargo is essential, then the most quickly available cargo will be better than none at all. We shall just have to wait and see what happens in this respect; but we are interested. There may be a lot more important things to bring home."

● Each of Canada's twenty-five newsprint manufacturers—including Powell River Company and Pacific Mills on the Pacific Coast—has been assigned an established percentage of total production under a compensation plan for the newsprint industry announced by the Canadian Wartime Prices and Trade Board.

The plan was necessitated by previous orders curtailing newsprint production.

The percentage of total production will remain constant unless and until changed by R. L. Weldon, administrator of newsprint in Canada.

The official announcement stated: "This is a fixed percentage of the total amount of newsprint invoiced by all manufacturers in any month." The statement continued that the established percentages of the various manufacturers were determined by the administration after many consultations with members of the industry's advisory committee.

Here's how the compensation plan will work:

When in any calendar month a manufacturer invoices to his customers and to other manufacturers a quantity of newsprint manufactured by him to excess of his established percentage, he will be required to remit a proportionate sum to a fund established by the prices stability corporation for the purposes of the order. When in any month a manufacturer invoices newsprint in an amount short of his percentage, he is to receive from the fund a corresponding sum. Cost of operating the compensation plan is to be borne by the stabilization fund.

Amounts which manufacturers are to remit or receive in consequence of allocation and other controls exercised since Sept. 1 last are to be fixed by the administrator on or before Jan. 20. Remittances to the fund and payments to other manufacturers are to be made on or before Jan. 25 and payments out of the fund by Feb. 1.

The announcement said that in the case of "transferred tonnage"—newsprint tonnage which the administrator orders transferred by one manufacturer to another for production—the Manufacturer who produces and ships it, is to invoice it at full price to the transferring mill, which is to pay on or before the 25th of the month following invoice date.

Each manufacturer who produces and ships transferred tonnage is required, when directed by the administrator, to pay into or receive from the fund whatever amount is necessary to adjust the basic mill

Canada Establishes Newsprint Compensation Plan

net price of the tonnage to the basic mill net price of the manufacturer's own tonnage of newsprint.

The order defines "basic mill net price" as that received by each manufacturer from his customer after reducing, (1) all transportation and delivery charges paid by the manufacturer; (2) all storage and incidental charges paid by the manufacturer, in the case of water shipments, and (3) all up-charges or extra charges made by the manufacturer for newsprint other than standard white newsprint in rolls, as customarily wrapped for shipments to customers in Canada and the United States.

Contributions to the fund on account of tonnage in excess of established percentage are determined by a complicated formula. It is set forth in the order as follows:

"Such sum shall be the product of the average price per ton charged by the manufacturer for the newsprint paper invoiced to his own customers in such month multiplied by the number of tons of such excess

tonnage, less an amount equal to the difference between such manufacturer's total costs of operation during such month and such manufacturer's total estimated costs of operation at the level of his established percentage including in both instances full allowances for depreciation and fixed charges." The amount to be received from the fund by manufacturers falling below their established percentage is similarly computed.

In determining the amounts to be paid or received, however, the administrator is authorized to consider gains or losses arising from the manufacture on newsprint machines of products other than newsprint paper with respect to the relative profits of such other products compared to newsprint and also any reduction in costs occasioned by operations at a rate below the established percentage.

It is provided that no manufacturer shall be entitled to receive or participate in any compensation for tonnage in excess of his recognized capacity to produce newsprint, based upon his previous performance as determined by the administrator.

If at any time payments into the fund exceed disbursements by an amount unnecessarily large, the administrator may order payments to the manufacturers on the basis of their established percentages. If, on the other hand, payments prove insufficient for requirements, the administrator may order payments to the fund by manufacturers on the same basis.

Hartwig Heads Investigation Of Dormitory Fire

● Otto Hartwig, veteran safety expert for Crown Zellerbach Corp. and Rayonier Incorporated, was recently given an assignment outside his familiar fields in the lumbering and pulp and paper industries when he was selected to investigate the Hudson House dormitory fire at Vancouver, Wash.

Seven men and women were killed in this disastrous fire on November 13 and many others were injured. The plywood dormitory was housing shipyard workers.

Mr. Hartwig, who is chairman of the Oregon state committee for conservation of manpower in war industries, a federal group, was asked to make the probe for the National Housing Authority in Washington, D. C. He completed his report, with his own conclusions, on January 7.



Westminster 20-Year Club

● An important milestone in the history of one of the Pacific Northwest's most progressive pulp and paper enterprises and a happy reunion were simultaneously marked at Vancouver, B. C., December 23, when members of the Twenty-Year Club, comprising members of the Westminster Paper Company who have been with the organization since its inception 20 years ago, held an informal dinner to celebrate the event.

J. J. Herb, president of Westminster Paper Company, New Westminster, and also head of the Pacific Coast Paper Mills at Bellingham, Wash., presided at the gathering, which was held at the Terminal City Club. With him were two sons—E. M., vice-president of the West-

minster Paper Company, and F. J., vice-president of the Bellingham company; R. C. Onkels, superintendent of the Westminster Paper Company, and his brother P. J. Onkels, superintendent at Bellingham; F. F. Foote, secretary treasurer at New Westminster; Max Bailey, Louis Pumphrey, Clarence Taylor and W. Jacobsen, all machine tenders; William Dynes, Mrs. Edna Smarge, James Young, George Woodward, all of the finishing room staff; M. E. Wilson, accountant. Mr. Wilson attended in the uniform of the Canadian army, having just enlisted as a private for active service.

The only member of the little group who was not actively with the company when the first plant went into operation on the banks of the Fraser River was Mr. Herb's younger son.

Highlight of the dinner was the presentation of a silver tray to the president and founder bearing the inscribed signatures of the fourteen "originals"—members of the Twenty Year Club.

Most of those present recalled early incidents in the company's history and swapped anecdotes about the days when Westminster Paper Company was just a struggling little paper specialty mill with a reputation yet to be won and markets still to be found.

Mr. Herb, Sr., recalled how his career in the paper business had begun when he was a sweeper in the Thilmany Paper Mill at Kaukauna, Wisconsin, some 54 years ago. Twenty-four years later he moved to Canada and built the Interlake Tissue Mills, Ltd., which he operated for ten years. Then he recognized the future possibilities of the Pacific coast as a base for pulp and paper production and moved to the Puget Sound country, establishing new mills at Bellingham and New Westminster.

Fire destroyed the New Westminster plant in 1929, and although long years of business depression were to follow for the world Mr. Herb refused to be discouraged and rebuilt the mill on modern, bigger more efficient lines.

The company produces kraft and sulphite wrapping, second sheets, fruit wraps, tissues and specialty products at its New Westminster mill which ordinarily employs about 150 men and women.

Mrs. Chalupa Spends Holidays in Spokane

● For a period of six weeks over the winter holidays, visitors at the Longview Fibre Company missed their usual cheery welcome from Mrs. Gladys Chalupa, the company's receptionist and switchboard operator. Mrs. Chalupa, who has been with Longview Fibre many years, had leave for that period of time to visit her husband who is installing electrical equipment in an aluminum plant in the Spokane area.

Scheuerman Visits Coast Mills

● Joseph Scheuerman, western sales manager of the Cameron Machine Company of Brooklyn, N. Y., was a Pacific Coast visitor early in January.

With Ed Tidland of the Pacific Coast Supply Company, Cameron representatives, Mr. Scheuerman installed a Type 18 Cameron winder with 150-inch drum face and constant tension device, in the mill of the Soundview Pulp Company at Everett, Washington.

Before returning to his headquarters in Chicago Mr. Scheuerman called on a number of mills in the three Pacific Coast states.

Bern Altick to Serve With War Production Board

● Bern Altick, assistant sales manager, Vernon Division, Fibreboard Products Inc., left for Washington, D. C., in December to serve in the Container Division of the War Production Board.

Mr. Altick has been with Fibreboard for almost 17 years working in the several plants up and down the Pacific Coast. With his moving to Washington for the duration, the Vernon Division loses one of its best low handicap golfers.

FIELD NOTES

A-B-Cs for rubber hose users.....

Don't use long lengths of hose that must be dragged excessively. Use shorter lengths and more of them. Result, - less drag and wear on hose.

Don't expose hose unnecessarily to direct sunlight. Shelter hose in outside service with a roof, lean-to, house, etc., when not in use.

Don't junk couplings and fittings on worn-out industrial hose during this period of critical metal shortages. Salvage and recondition used couplings. Send them in to your supplier when buying a new length of hose. In most cases they can be reattached at a very nominal charge.

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Not a fighting plane leaves the ground without rubber. And plenty of it. We're short of rubber. Yet through the cooperation of American industry, lengthened service from present rubber hose and belting will free needed rubber for use by our armed forces. It's our mutual obligation, yours and ours, to extend the life of our present rubber to its very utmost.

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Retzlaff Takes First Half Bowling Honors

● The Pipefitters' team and Vern Retzlaff of the Mechanics carried off the top honors at conclusion of the first half of the bowling season for the Longview Fibre Company league at Longview, Wash.

The Pipefitters had a five-game margin to win team honors and Retzlaff proved an outstanding individual star, although on a losing team. His high individual game was 266 and his series record, also tops, was 687. The Pipefitters had the high team game of 1075 and high team series score of 3053.

Individuals and teams started off with a clean slate in the second half tournament which began January 5 and will end April 1. Tom Mendenhall of the production department, who is secretary for the league, announced the following final results of the first half season:

	Points		
	W.	L.	Pct.
Pipefitters	40	12	.769
Machine Room	35	17	.673
Pulp Mill	27	21	.562
Supervisors	29	23	.558
Box Plant	25	23	.521
Mechanics	22	26	.458
Bag Plant	15	33	.313
Control	15	33	.313
Office	16	36	.308

Dow Chemical Awarded Two Army-Navy "E" Flags

● The Dow Chemical Company, Midland, Michigan, was recently awarded two Army-Navy "E" flags for excellence in war production.

Major general William N. Porter, chief of the Chemical Warfare Service, made the awards, saying in part that Dow's production has "in some instances doubled the capacity of your plants, and what is more, it has been consistent." He also commended the maintenance of high labor standards and employee relations. "The trust the government has reposed in you is reflected in the volume of contracts which The Dow Chemical Company has completed and is completing," said general Porter.

Accepting the unique double award, Dr. Willard H. Dow, president, emphasized the importance of chemicals in modern warfare. "More than 2,000 chemicals are needed to build an airplane. More than 200 different chemicals are required for a tank," he said.

Puget Sound Holds Big Christmas Party

● A high tribute to the devotion and enterprise of Ossian Anderson, former president, who died last September, was paid by Lawson P. Turcotte, executive vice president of the Puget Sound Pulp & Timber Company, in a talk at the annual banquet of the company at the Hotel Bellingham on December 26th. Mr. Anderson's passing deprived the company of a great leader, he said.

The banquet was attended by about 500 men and women, a surprisingly large attendance in view of the fact that 20 per cent of company employees had been drawn into war services of one kind or another, it was stated. Mr. Turcotte spoke of the harmonious relationship among all branches of the company's activities that had existed the past year,

and forecast a bright outlook for the future in spite of difficulties arising through the war. He acted as toastmaster at the banquet.

Following Mr. Turcotte other members of the management made short talks. Ralph M. Roberg, vice president in charge of sales, described the workings of government in wartime. Others speakers were, Harry Binzer, secretary, who is now serving in the legislature as senator from Bellingham; William Sealy, treasurer; and Erik Ekholm, general superintendent.

H. P. Rowe, president of Local 194, International Brotherhood of Pulp, Sulphite & Paper Mill Workers, spoke briefly, pledging the members of the union to support of our war effort.

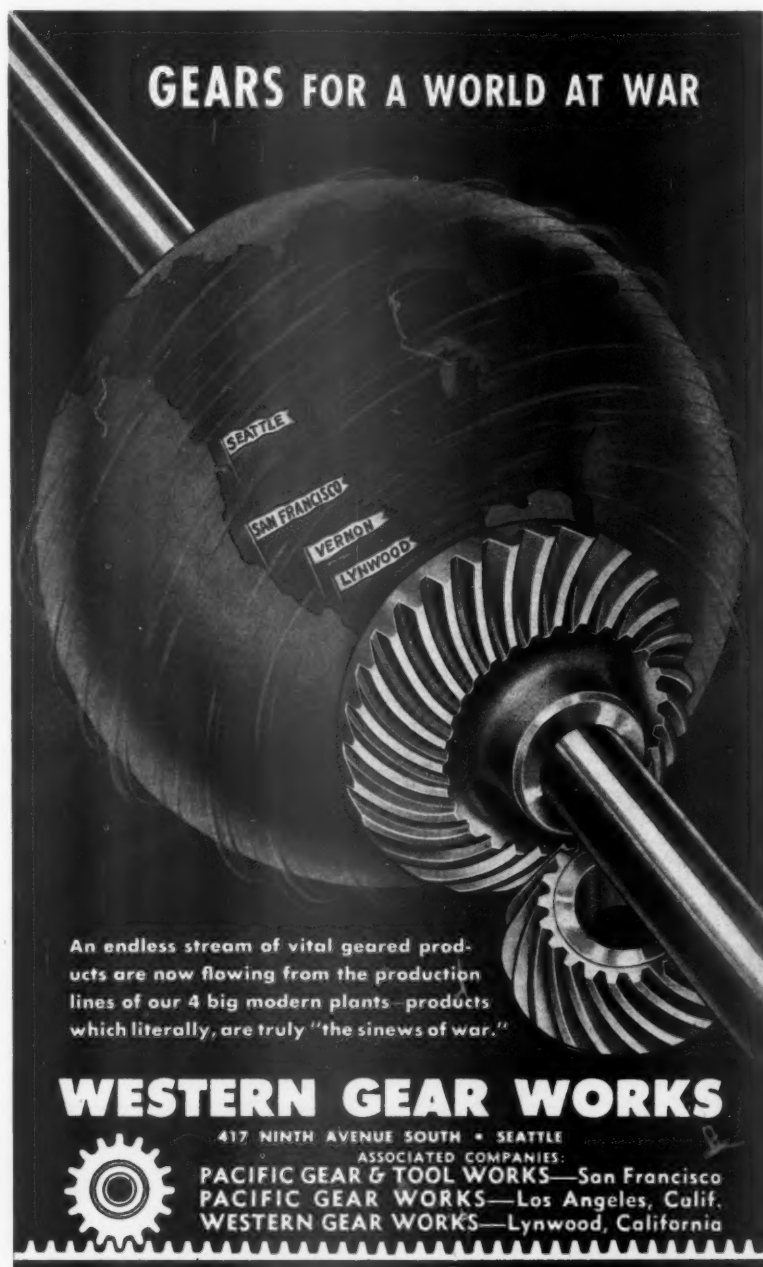
Dancing in the hotel ballroom followed the banquet.

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Women Operating Grinders In Two Mills

● Now the women are being used, even running grinding machines in the St. Helens Pulp and Paper Co., St. Helens, Ore., and Longview Fibre Co., Longview, Wash. Nine women are running wet machines at Hawley Pulp and Paper Company at Oregon City and more will be put on.



GEARS FOR A WORLD AT WAR

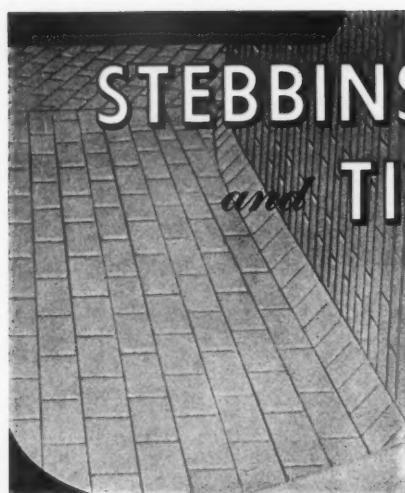
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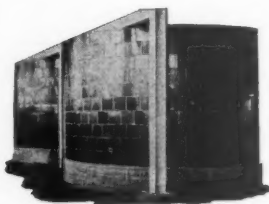


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Lyle Watts Appointed Chief U. S. Forester

● Secretary of Agriculture, Claude Wickard, announced January 8th, the appointment of Lyle F. Watts, former regional forester at Portland as chief of the United States Forest Service. In recent months Mr. Watts has served as an assistant to Secretary Wickard. His appointment fills a vacancy in the forestry post caused by the death of F. A. Silcox in 1939. Earl H. Clapp had been acting as chief since that time.

As an assistant to Secretary Wickard, Mr. Watts handled the problems involved in enrollment of Mexican labor for last Fall's crop harvests. This was part of his assignment of coordinating farm labor activities. He was chosen for this post because in the Forest Service he had gained an intimate knowledge of labor conditions. He had wide experience in handling skilled and unskilled workers in dealing with livestock, men and farmers. In earlier years he employed many trailer, road and brush disposal crews.

Born in Iowa and graduated from Iowa State College, Mr. Watts entered the Forest Service in 1913. He served as supervisor in national forests of the West, taking leave from government work for one year in 1928 to organize the School of Forestry at Utah Agricultural College. He became Regional Forester for the North Central Region in 1936, and in 1939 was transferred to the identical post in Portland for the North Pacific Region.

Tom Martin Suffering From Illness

● Thomas R. Martin, of the technical department of the Camas Mill of the Crown Willamette Paper Company, was away from his post because of illness in early January. He is supervisor of product quality.



LYLE F. WATTS, Chief U. S. Forest Service.

Harry Fletcher to Receive TAPPI's Gold Medal

● Harry Fletcher, president of the Fletcher Paper Company, Alpena, Michigan, will receive the TAPPI gold medal at the association's annual meeting February 15-18th, in New York.

The TAPPI medal is awarded for outstanding contributions to the technical advancement of the pulp and paper industry.

Mullin Visits Coast Mills

● At the start of the new year, J. L. Mullin, vice president and general manager of the Hopper Paper Company of Taylorville, Illinois, visited a number of Pacific Northwest pulp and paper mills.

The Hopper Paper Company are well-known manufacturers of offset, papeterie, envelope, rag content and sulphite bonds, greeting card and index stock and specialties.

"Beacon Bill" Christmas Campaign Sets Record

● The "Beacon Bill" campaign of the Evening News at Port Angeles, which carries an interesting share of the relief responsibility of that community, concluded its 20th year at Christmas time with the greatest record of its history.

When dimes and dollars had rolled in in response to the friendly "black mail" lines "Beacon Bill" had written about his friends, the total was approximately \$6,000.

The "Beacon Bill" idea was originated in December, 1922, by William D. Welsh, then editor of the Port Angeles Evening News. Without interruption he has since written the column and personally conducted the Christmas campaign. Following his retirement from the Evening News in 1939 to join the Crown Zellerbach Corporation in San Francisco, Mr. Welsh has made four annual trips north to keep the tradition alive.

Each year employees of Rayonier Incorporated cut a special wooden plank for "Beacon Bill," dress it up with holly and a Christmas message, then inscribe it with their names and the amounts given by individuals. This year the Rayonier plank brought the Christmas fund \$1181 in one lump sum.

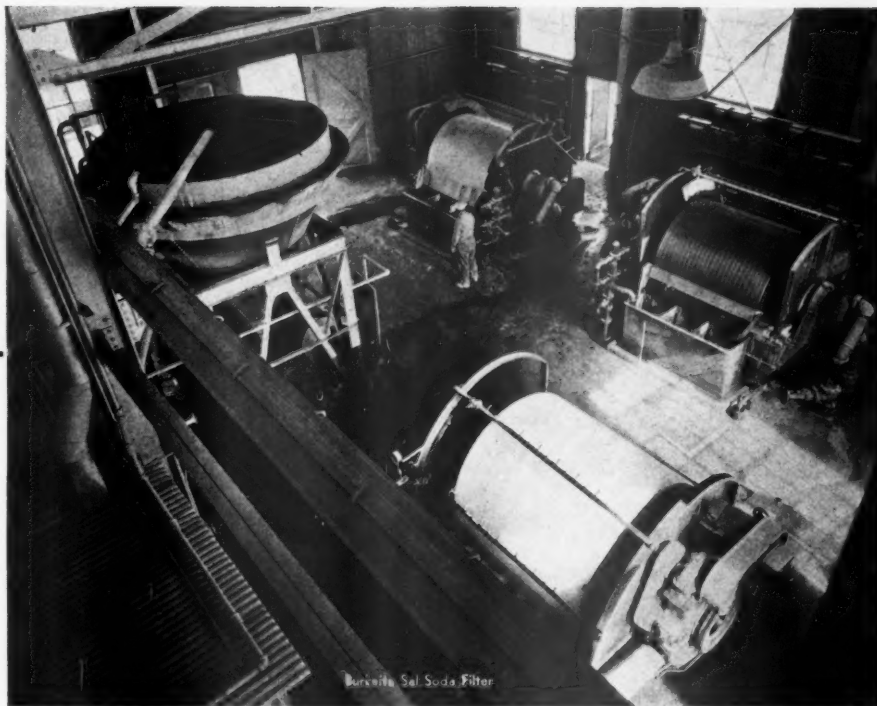
The Crown Zellerbach newsprint mill's "roll" is physically expressed by a large roll of newsprint on which names of the donors have been written. The total this year was \$775.

Fibreboard Products, Inc., Olympic Shipbuilders, and the Peninsula Plywood Company and their employees made liberal contributions.

The fund is expended for Christmas baskets and throughout the year for hot lunches for school children, eyeglasses and dental care for needy children, repair of school shoes and other items of emergency relief.

The "Beacon Bill" fund is unique in that in its 20 years of operation, no administrative cost has been charged against it. Every penny contributed is expended for actual relief of the needy.

A new feature this year was a contribution of \$1000 to the American Red Cross, earmarked especially for relief of families of soldiers, sailors and marines in Port Angeles and Clallam county in instances where allotments have been delayed, or where relief is necessary



Recovery of Sodium Carbonate at Trona

American Potash & Chemical Corporation

609 South Grand Avenue, Los Angeles, Calif.

122 East 42nd St., New York City

through insufficient income. An additional \$200 was allotted to the Red Cross hospital and camp committee, all Red Cross home service Christmas bills were paid, and 200 going-away shaving kits purchased for men leaving Port Angeles and the county for service with the armed forces.

The Port Angeles Chamber of Commerce has penned an appreciative official letter to executives of the Crown Zellerbach Corporation and Rayonier Incorporated for their cooperation in agreeing to Mr. Welsh's continued contact with the campaign. In spite of a four-year absence, he still is considered a "citizen of Port Angeles."

Mrs. Berney Speaks Before Personnel Convention

● V. C. Gault, personnel supervisor, T. M. Tedford and Mrs. Vera Berney of the Crown Willamette Paper Company, division of Crown Zellerbach Corp., at Camas were in Spokane January 8 and 9 to attend the Pacific Northwest Personnel Management association convention. Mrs. Berney addressed the convention on "Women in Wartime." En route back to Camas, she visited her parents in Walla Walla.

Hugh Bolger Back On the Job

● H. J. Bolger has returned to his desk as head of the San Francisco office of Pacific Coast Supply Co., doing a good two-fisted job with one arm.

While in Portland in early December, Mr. Bolger slipped and fell, suffering a compound fracture of his left arm, at wrist and elbow. Returning to San Francisco, after a three days' visit in Portland which extended into three weeks, his physician discovered the wrist setting had slipped, must be rebroken and reset.

The holiday season was spent in a hospital, and after a painful ordeal he hopes the cumbersome cast soon will be removed, thus saving considerable expense in the creation of one-arm shirts via processes of mutilation. Meanwhile, his good right hand is working overtime in dispatching the business of his busy office.

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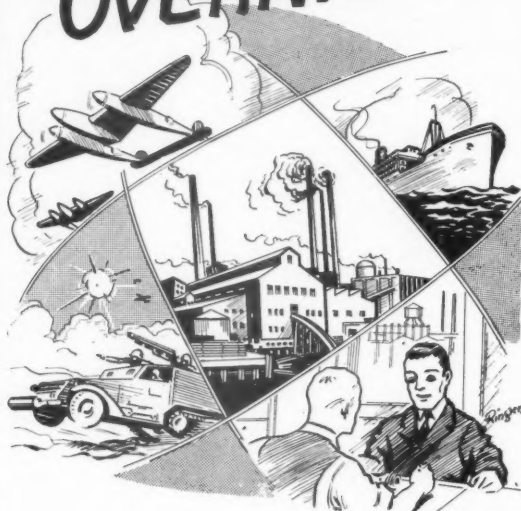
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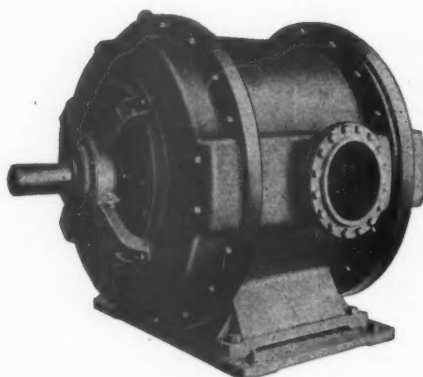
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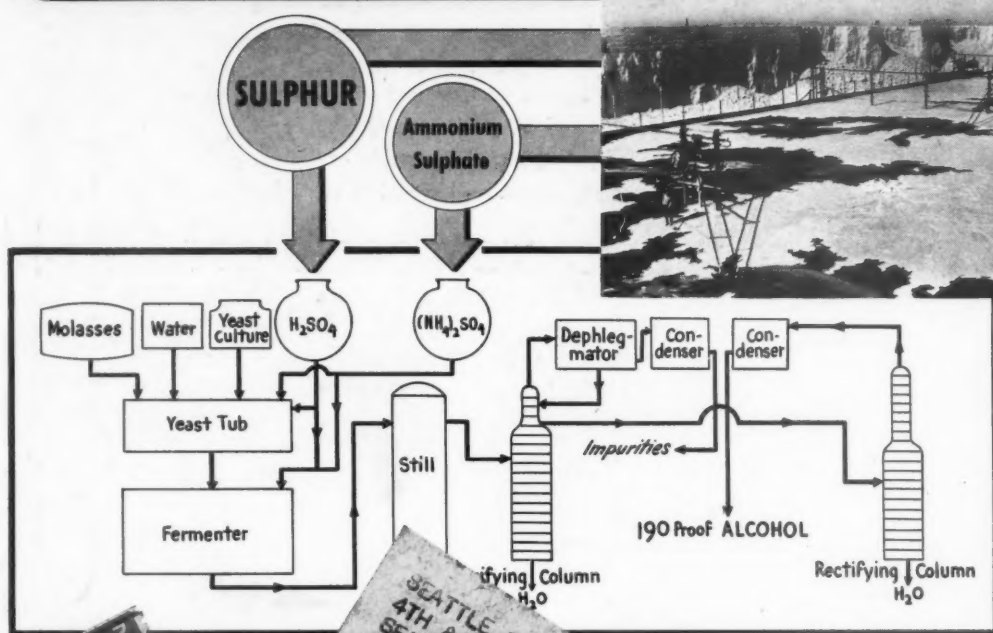
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